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NATIONAL STANDARDS FOR FARM PRODUCTS

Prepared in the *Bureau of Agricultural Economics*[1]

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INTRODUCTION

The development of national standards for farm products has taken place almost entirely during the last 20 years, although grades for farm products have been used to some extent since the beginning of commercial agriculture. Such standards had been worked out for all the leading farm products several years ago, but the development is still going on, for almost every year national standards are applied to farm products for additional purposes (as for canning) and some existing standards are revised in line with the findings of research.

Before the World War there was much variation in the grade definitions and in the grade terminology as used in different markets and as used by different individuals in the same market. Such grade terms as "Best" and "Fancy" came to have little definite meaning and therefore had little value. The growth of large terminal wholesale markets, and the sale of farm products by telegraph and especially by futures contract, made some uniform system of grading almost indispensable for the marketing of the most important farm products.

[1] This circular was originally prepared in 1927 under the direction of Lloyd S. Tenny, then Chief of the Bureau. It was revised in 1930 and has now been revised again by Caroline B. Sherman, Associate Agricultural Economist, Division of Economic Information, in collaboration with the standardization specialists of the Bureau.

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The passage of the United States Cotton Futures Act in 1914 (reenacted in 1916), and the United States Grain Standards Act and the United States Warehouse Act in 1916, recognized the growing need for a uniform grading system. These and other acts of the Congress have authorized and directed the Bureau of Agricultural Economics (and its predecessor in the work, the Bureau of Markets and Crop Estimates) to develop standards for farm products and to provide for inspection in order to bring about a uniform application of the grades and to settle disputes.

USE OF NATIONAL STANDARDS

Up to the present time the national or official standards have been most widely used in wholesale transactions and until recently they have not been applied very generally either to the sale of small lots by farmers, to the consumers, or to retail purchases in stores. This is a natural result of the generally recognized fact that the grading and inspection of small lots is expensive and often will not pay for itself. Farmers who sell in small lots usually are affected indirectly by the grading system since the price they receive depends partly on the quality of products produced in their community as shown by grading records. Then, too, every attempt is made to develop grading methods which are inexpensive and which can be applied to small lots, so that many farmers now sell their products according to grade.

The use of national grades in retail trade is a recent development. The first notable retail use of such grades was when the Bureau of Agricultural Economics began to stamp many of the graded meats with a rolling stamp that so placed the class and grade name on the carcass that each retail cut would show these names. First beef, then veal, calf, lamb, and mutton have been graded and stamped in large quantities for retail use. At present, grades especially adapted for retail or consumer use have been established for eggs, butter, turkeys, rice, dry beans, and the more important canned fruits and vegetables, and products bearing these grade names are found, to a varying extent, on the retail shelves.

When these grade names have been applied and are still on the product when in the retail store, the consumers can easily identify the quality of the food they buy. Interest in consumer grades and in the use of official grades by consumers is developing rapidly. Consumers are insisting on the right to know what they are buying. This is particularly true of certain foods like eggs and canned goods, the quality of which cannot be judged by their appearance in the store.

The use of the official cotton and grain standards of the United States is required in all interstate transactions based on grade and any products stored under the United States Warehouse Act, if graded, must be graded in accordance with the official standards of the Department of Agriculture, if there be official standards.

But the use of the grades in most of the standards recommended by the Department is optional except that certain Government purchases must be based on these standards and that a number of States have passed laws requiring the use of some of these United States grades for products grown within the State.

TESTING OF STANDARDS

Establishment of national standards for grades is a problem that goes far beyond a determination of a logical and scientific scheme of classification. The present standards for agricultural products as recommended or promulgated by the United States Department of Agriculture do not necessarily represent a complete standardization program for all of the products and, as their use is so largely permissive, it has been necessary to make rather broad classifications in some instances and to refine the standards as experience in actual use indicated. The individual grades have usually been based on the results of the departmental research but the final standards have sometimes been modified substantially to meet the views of various groups in the industry. The Bureau of Agricultural Economics has served in the capacity of a fact-finding and coordinating agency, furnishing, as a result of painstaking research, pictures of varied conditions and practices throughout the producing areas and in both foreign and domestic trade, and assisting wherever possible in harmonizing the divergent views of competing areas and interests.

Official standardized grades promulgated or formally recommended by the Department have usually been subjected to extensive tests to determine their practicability under actual commercial conditions. The demand for grade descriptions for immediate use has frequently been met by issuing tentative grades which, although based on the best available information, had not yet been demonstrated practically.

GENERAL PRINCIPLES UNDERLYING GRADES

In general, official grades are defined in such a way that the highest grade in a set of standards represents those characteristics which bring the highest prices in the market. Lower grades represent characteristics which are less preferred and therefore bring lower prices. Preferences are usually based directly or indirectly on utility, or on what is sometimes called "intrinsic value" or "use value." Thus, there is a strong preference for medium- to large-sized potatoes because less time and less waste are required in preparation for the table. Other preferences are less directly based on tangible differences in utility. For example, most consumers prefer highly colored apples, although for certain uses the utility of the color may be largely psychological.

A grade of a farm product specifies in all cases the lower limits of quality permissible within the grade and may prescribe both upper and lower limits. The limits for a practical grade must be broad enough to avoid unnecessary technicalities and must conform to some extent to trade practices. As a result there is sometimes some difference in value between commodities near the bottom of the grade and those that reach the top limits. The extent to which a grade reflects the relative value of the product depends on the completeness with which it deals with the various factors influencing price and on the range of quality permitted in any one grade.

Technical experts in the Bureau of Agricultural Economics are constantly at work developing equipment and methods for measuring the quality of agricultural products. As the result of such re-

search, methods and equipment have been devised for measuring the moisture content of grain, for determining the foreign-material content of grain, and for measuring the color of hay and cotton. Such equipment and other equipment for other commodities have been adopted into grading and inspection work the country over and are of great value in giving definiteness and preciseness to numerous important grading factors.

Established trade practices have frequently associated grades with a limited number of factors. Cotton is classified as to grade chiefly on the basis of color and freedom from trash. Length of staple, equally important in trading, is dealt with separately. The complexities of grading have sometimes made it necessary to confine the grades to a single factor, pending such time as research shows the practicability of including other factors of quality. Thus the present official wool standards of the United States are based wholly on diameter of fiber.

The national standards, or systems of grades, adopted in this country do not change from month to month or year to year in accordance with the variation of the quality of the crop produced. Changes are made in grade requirements and definitions only after careful study has shown the need of what appears to be a permanent modification.

ADVANTAGES OF STANDARDIZATION

The purpose of standardization, broadly considered, is to facilitate all of the marketing processes. Farm products may pass through many hands in moving from the centers of production to the wholesale markets. Many products are contracted for, for future delivery, and a large part of the business is transacted at long range. It is essential that there be a common language to insure mutual understanding between buyer and seller. A general grouping of the product into grades of the same range of value or utility is usually sufficient. It is true that certain manufacturers of raw agricultural products require a personal inspection by their representatives, which accounts for a large volume of trading on the basis of samples in such products as cotton and tobacco.

The chief advantages of standardization may be considered in two groups: (1) The advantages of a common language between buyer and seller and other financially interested parties like banks that loan money on warehouse receipts, and (2) the advantages of actually separating the product into different grades of market quality.

The necessity for a common language is apparent as a basis for future contracts. This is particularly true in dealing in such commodities as cotton and grain where future trading is now well organized on the basis of definite specifications for each grade on which trading takes place. With such commodities as cotton, one of the first advantages of standardized grades is found in the facilities they afford for the establishment of basic prices and differential quotations. With some other commodities, such as fruits and vegetables, where the industry does not deal in future contracts to such an extent but where the volume of actual sales for future delivery is by no means inconsiderable, too much trading is still

conducted on the basis of vague descriptions. This loose method of doing business has resulted in endless disputes.

Clear and definite grades are likewise indispensable in transactions through exchanges and in making telegraphic sales and sales in transit, or in any circumstances where the buyer cannot exercise the privilege of inspection.

Standardized grades facilitate the settlement of claims. Claims against the railroad companies for losses incident to the transportation of agricultural products run into millions annually. To arrive at a basis of adjustment it is necessary to establish the value of the product and to correlate the reported market prices with the specific lot on which the claim is sought. When evidence can be produced to show that a shipment was of a certain grade, it is relatively easy to establish the prevailing price. The American cotton standards are now used practically throughout the world as the basis for arbitrating the disputes arising out of transactions in American cotton (fig. 1.).

Standard grades are necessary to permit an intelligent comparison of market prices and as a basis for Nation-wide inspection services.

ADVANTAGES OF SEPARATING THE PRODUCTS INTO GRADES

Equally important advantages are to be gained by actually separating the product into different grades of market quality.

Well-graded products make it possible to reduce distribution costs by eliminating waste both economic and physical. The manufacturer finds it unnecessary to order 10,000 pounds of wool to insure receiving 5,000 pounds of the quality he requires, and the dealer in fresh fruits and vegetables is not required to sort out and throw away produce that might have been used profitably in other markets or at some byproducts plant but that is not suited to the demands of his particular trade.

Actual separation of the product into various grades permits more effective distribution. Effective distribution consists in finding the market that will give the grower the largest return for his product. This involves (1) reaching the widest territory that transportation costs and the physical limitations of the product will permit, (2) extending the marketing season to allow the longest possible period of time to dispose of the crop, (3) conforming to trade preferences to meet the broadest range of consumer demands, and (4) reducing distributors' margins to a minimum.

In cooperative marketing associations grading affords a basis for pooling the products of various growers to enable all to share alike in the season's sales.

Standardization is of fundamental importance in relation to such marketing functions as financing and advertising. Warehousemen who operate under the provisions of the United States Warehouse Act are required to use official grades on the warehouse receipts if any grade is designated and if any standards have been established by the Government for the commodity in question. In the absence of Federal standards, the grades used must meet with the approval of the Department; in fact the Department has formulated certain standardized grades pending the adoption of official standards. Grade must be stated on warehouse receipts of all products stored on a fungible basis, and on all other products except when the deposi-

tor requests the omission of the grade. The purpose of the Warehouse Act is to enable producers to make a freer use of receipts as collateral for loans. The banker's location may be distant from the

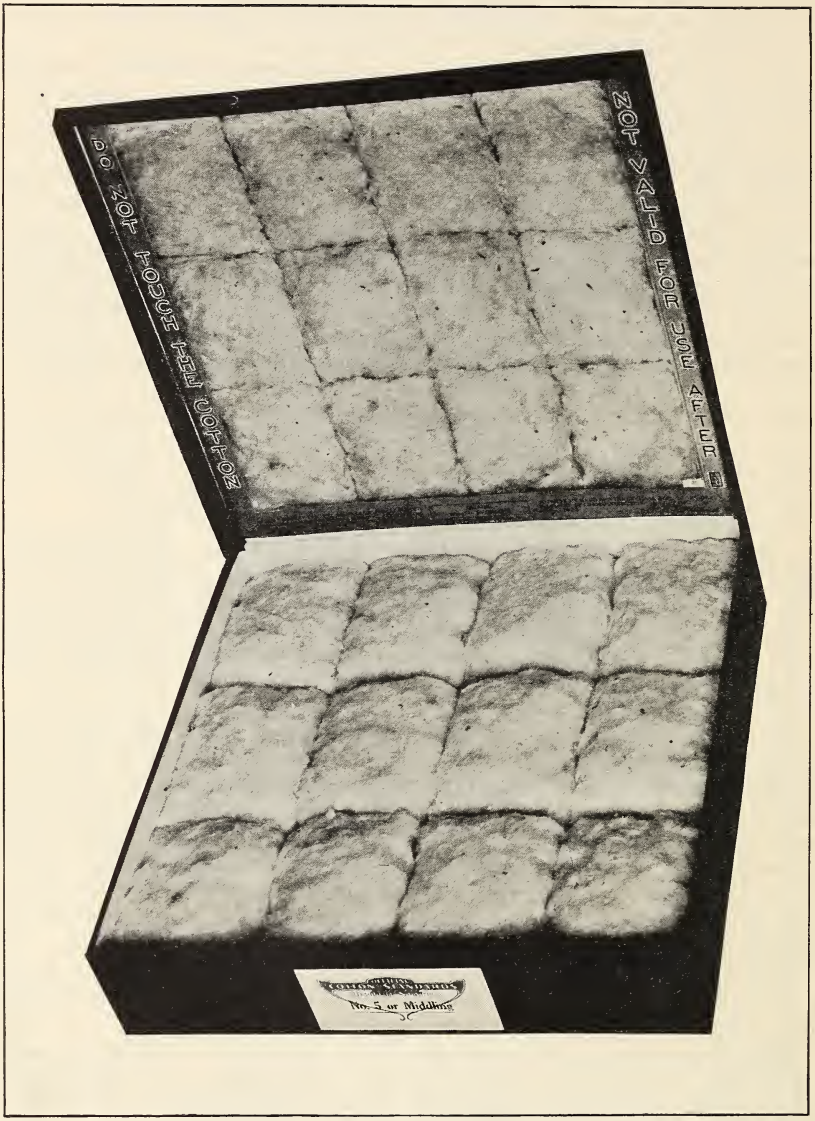

FIGURE 1.—Practical form of the universal standards for the grade of Middling cotton. In the upper half is a photograph, inserted in cover of the box, to verify the preparation of the cotton and the position of the leaf. At the bottom of the photograph is the seal of the Department of Agriculture and the certificate and signature of the Secretary of Agriculture. Standards for the other grades and for color are represented in the same way.

point where the products are stored. His only means of ascertaining the value of the products is to have a statement of the quantity and the grade of the products which are to constitute the collateral. If

these receipts are to be accepted by the banks on the most favorable terms to the borrower, they must be dependable. The best way to secure this dependability is to place responsibility back of the warehouseman, and then to require the warehouseman to conform to recognized standards.

The desirability of standard grades as a basis for advertising is obvious. Advertising is worse than futile unless backed up by uniformly dependable products.

The application of standards exerts a direct and important influence on production and handling practices. Not only is the attention of the grower or shipper directed to his mistakes, thus setting him about correcting them, but he is also likely to receive a proper remuneration for adopting more careful and effective methods. It has been a common observation in marketing all classes of agricultural products that where no standards are recognized the tendency of the trade is to pay a flat price based on the average value. There is certainly scant encouragement in this practice for the man who sacrifices yield for quality. Conversely, trading on a quality basis is the greatest stimulus to better methods of production, and definite uniform grades are the means to that end.

Those who wish to go further into the subject, who wish to know the work on any commodity in greater detail or to obtain the detailed descriptions or specifications of any set of standards, should write to the Bureau of Agricultural Economics, United States Department of Agriculture, Washington, D. C.

COTTON

Cotton grading, according to the best historical records, began in Liverpool about 1800. Until a comparatively few years ago its practice was limited almost entirely to persons engaged professionally in the cotton trade. Through commercial usage a system of grading grew up that was adopted by graders and spinners. Uniform grade names were used in American markets, but the qualities represented by these grades were not uniform. They varied both in different localities and from year to year, depending upon custom and the average quality of the crop.

Official standardization of cotton grades began in 1909. In that year the Agricultural Appropriation Act contained an item for the express purpose of enabling the United States Department of Agriculture to undertake systematic work in cotton standardization and carried authority to establish official standards for the nine grades of white American cotton. Subsequent appropriations provided for the continuation and extension of this work. No authority was provided to apply the grades in any way or to entertain or determine any disputes in connection with their application. These permissive standards never came into commercial use.

Actual promulgation of United States standards representing these nine grades of upland white cotton was first accomplished under the United States Cotton Futures Act on December 15, 1914. The use of these official cotton standards of the United States was made compulsory on the New York and New Orleans Cotton Exchanges under the provisions of the same act on February 18, 1915. The standards for yellow-tinged and yellow-stained upland cotton were

promulgated January 28, 1916. The sea-island and American-Egyptian standards and the standards for length of staple were promulgated October 25, 1918. The standards for sea-island cotton were discontinued in 1925, as the production of sea-island cotton was discontinued.

On July 26, 1922, the Secretary of Agriculture signed an order revising the existing standards, effective August 1, 1923, the same date that the United States Cotton Standards Act became operative. The standards established under the Cotton Futures Act were made the official standards under the Cotton Standards Act as well. Under the provisions of the latter act all transactions in interstate and foreign commerce and all published prices and quotations shall be based on the official grades unless the transaction be made in good faith on the basis of sample or private type and not in evasion of or substitution for the official standards.

Utilization of cotton in spinning depends largely upon its classification or, in technical language, upon its class. Class is the term used to express both the grade and staple length of cotton. Grade itself is a term denoting the composite of: (1) The color, luster, and brightness of the lint; (2) the nature and quantity of foreign matter present in the lint, such as leaf, dust, or other foreign matter; and (3) the preparation or ginning. The staple length of cotton is the length of its fibers.

For convenience of arrangement, the subjects of grade, staple, and character are separately considered. Since the upland varieties constitute all but a small fraction of the American crop, the discussion relates particularly to upland cotton, as distinguished from American-Egyptian and sea-island cottons. The principles, nevertheless, that govern in the classification of upland cotton apply equally to cotton of any growth, and in treating the classification of the American-Egyptian and sea-island varieties it is necessary only to point out certain of their special characteristics that are different from those of the upland varieties.

The nine grades for upland white cotton are—

No. 1 or Middling Fair.
No. 2 or Strict Good Middling.
No. 3 or Good Middling.
No. 4 or Strict Middling.
No. 5 or Middling.
No. 6 or Strict Low Middling.
No. 7 or Low Middling.
No. 8 or Strict Good Ordinary.
No. 9 or Good Ordinary.

In addition, certain grades are provided for yellow-tinged, yellow-stained, and blue-stained cotton.

American-Egyptian cotton bears so little resemblance to the upland varieties that it cannot be classed on the same standards. Under the Cotton Standards Act five numerical grades and 4 half grades are provided for the classification of American-Egyptian.

Practical forms of the standards for each grade (other than the descriptive grades) are prepared for distribution as provided by the act. Each practical form consists of a box made of heavy cloth-covered pasteboard in which are placed samples of 12 bales, all of the same grade. To this box is attached a hinged cover on the underside of which is mounted a photograph of the samples showing the size and position of the foreign matter originally present on the surface of the cotton and the quality of preparation. The photograph bears an imprint of the seal of the Department of Agriculture and a cer-

tificate of the Secretary of Agriculture dated and signed by himself or by another official designated for the purpose. The 12 samples that each box contains not only show the range or variation of leaf, color, and preparation allowed within that grade, but represent regional differences as well. For convenience of reference each sample is given a numbered position in the box.

As a general proposition it may be stated that the staple length of cotton is more important in a determination of its value than is its grade. Paradoxically, large quantities of cotton are bought and sold in the country markets as "average receipts" without any reference to staple, though in such cases the buyer knows from his current purchases about what proportion of the daily receipts are of the various staple lengths. Before such cotton reaches a mill, however, it passes through channels where it is carefully stapled, selected, and assembled in even-running lots.

Cotton is roughly divided according to its length into long staples and short staples. By custom, the dividing line is 1⅛ inches, cotton of that length and longer being known as long-staple cotton, extra-staple cotton, staple cotton, extra staples, or staples. Shorter lengths are referred to as short-staple cotton or short cotton. This line of demarcation is recognized by many trade organizations in cases where separate sets of rules are made for trading in long-staple and short-staple cottons. The tendency in recent years, however, has been to acknowledge premium value in any cotton 1 inch or more in length, and the term short staple has come to be applied by common usage more particularly to cottons that are less than 1 inch in length of staple.

Official standards for staple were established under the Cotton Futures Act on October 25, 1918, and practical forms of the standards are available for certain of these lengths. These standards for length are also the official standards under the Cotton Standards Act (fig. 2).

The length of cotton fibers is determined by pulling the staple. As every sample contains fibers of more or less varying length, the drawing out of representative fibers is a process involving much skill.

Of almost equal importance with grade and staple is the attribute of character, which refers to the strength, body, uniformity, and smoothness of the fiber. No standards for character have been established.

The official cotton standards of the United States for American upland cotton were adopted by the leading cotton exchanges of Europe during the summer and fall of 1923, and an agreement was entered into between the United States Department of Agriculture and the European exchanges to facilitate the use of the standards in foreign commerce. This action followed a series of conferences in Washington between representatives of the United States Department of Agriculture and of the foreign exchanges. The European parties to the agreement were the following:

Liverpool Cotton Association (Ltd.).
Manchester Cotton Association (Ltd.).
Syndicat du Commerce des Cotons au Havre.
Bremer Baumwollborse.
Associazione Cotoniera Italiana (now known as Associazione Italiana Fascista degli Industriali Cotonieri).

Association Cotonniere de Belgique. (The Marche de Coton a Gand is a party to the present agreements.)
Centro Algodonero de Barcelona.
Vereeniging voor den Katoenhandel te Rotterdam.
Federation of Master Cotton Spinners' Associations (Ltd.) of England.

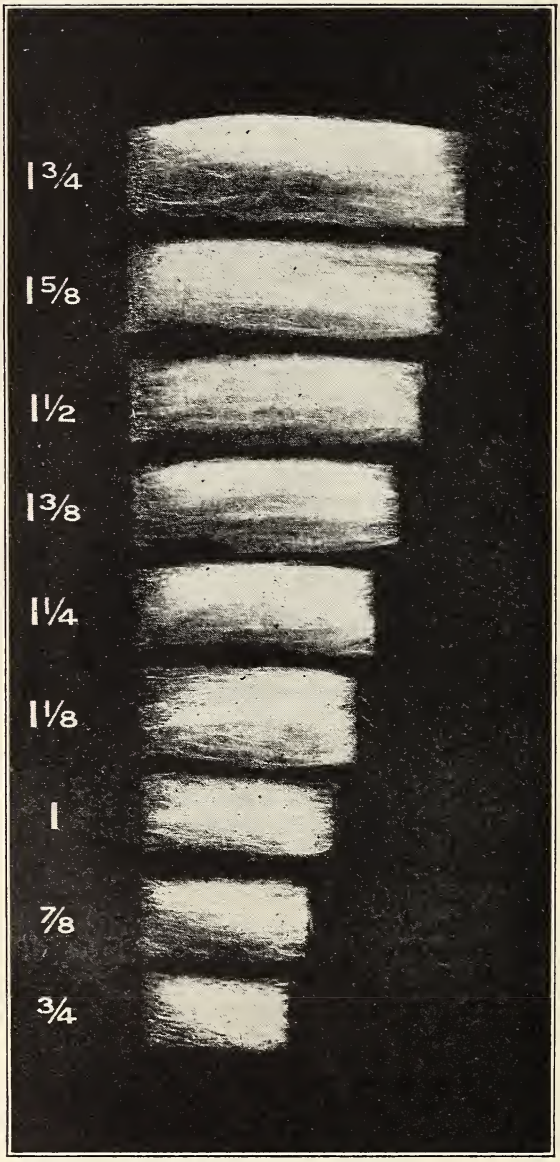

FIGURE 2.—A representation of some of the lengths of staple for which practical forms of standards are available.

The order of the Secretary of Agriculture of July 30, 1923, promulgating the revised standards, recited that since these standards

had been agreed upon and accepted by all of the leading European cotton exchanges, they might be termed and referred to as universal standards for American cotton.

The agreement between the Department of Agriculture and the European exchanges or associations provided among other things:

(1) That the associations would make the universal standards the basis of all their contracts in which grades are specified for the purchase and sale of American cotton.

(2) That the original standards were to be kept by the Department of Agriculture at Washington, and that no practical forms or copies of the standards would be used except those prepared by the Department.

(3) That during the time the agreement should remain in effect the Department of Agriculture would make no change or revision of the standards unless such change or revision had been considered in a meeting which the associations had been given opportunity to attend.

It being the purpose of the Department and the associations to establish and maintain the integrity, comparability, and uniformity of copies of the original universal standards, a supplemental agreement made provision for a meeting in Washington each year, beginning on the second Monday in March, the first such meeting to be held in 1925. It was provided that at such meetings each association might be represented by 1 or 2 experts in the classification of American upland cotton, and the United States was to be represented by as many experts as there were experts present representing the European associations who had signed the agreement. Each association was to have one vote and the United States a number of votes equal to the total number cast by the associations, and three-fourths of all the votes cast was to be required for any action.

The sole purpose of the annual meeting provided for in the supplementary agreement was the examination and approval of 40 or more sets of copies of the original universal standards for the use of the United States and the associations during the year beginning on August 1 next following each meeting (fig. 3).

The supplemental agreement was amended in 1925 to provide that thereafter instead of annual meetings in Washington there should be a meeting in Washington on the second Monday in March every 2 years, beginning 1927.

Except for the addition of five grades for Extra White cotton the official standards for grade of American upland cotton were not changed after their promulgation in 1923, until August 20, 1935. On that date a general revision was promulgated, effective August 20, 1936. This revision, which became necessary on account of changes in the cotton crops of recent years, embraces 9 grades for white cotton, 7 for extra white, 3 for gray, 5 for spotted, 5 for tinged, and 3 for yellow stained. Eight of the grades for white cotton and the five grades for tinged cotton are represented by standards boxes, and all of the other grades are descriptive.

COTTON LINTERS

Standards for American cotton linters have also been provided under the provisions of the Cotton Standards Act. These standards

became effective August 1, 1926. Production of linters in some years has reached a total of approximately 1,000,000 bales.

Grading of linters is based primarily on the different blends of the unginned cotton fibers and of the seed fuzz that are formed during delinting, a process in conditioning the seed for oil extraction. These blends are directly correlated with the requirements of consumption. Standard Grade No. 1 is composed chiefly of unginned cotton fiber and Grade No. 7 is composed chiefly of the seed fuzz. The consumers of linters may be divided into three groups—spinners, felters, and chemical users. Probably the largest consuming group is composed of the felters. This group includes the makers of bat-

FIGURE 3.—Preparing practical forms of the universal standards for American cotton.

ting, mattresses, cushions, wadding, paper, etc. It utilizes all grades of linters.

Linters containing the largest portion of long fibers are spun and made into cheaper grades of cloth, and such articles as twine and lamp wicks. They are also bleached, sterilized, and batted for use as absorbent cotton or for other similar purposes.

In the chemical group are included all consumers that use cellulose as the base of their products. Cotton linters contain from 70 to 85 percent of available cellulose. During recent years the uses to which linters have been put by this group have made an unprecedented growth. The seed fuzz seems to be preferred for chemical purposes, especially since its low cost makes it compete favorably with other sources of cellulose. Standard Grades Nos. 5, 6, and 7 are preferred for many chemical uses.

DAIRY AND POULTRY PRODUCTS

CHURNING CREAM

Tentative United States grades for churning cream were provided early in 1935. The purpose of these grades is to make feasible the purchase of cream from producers on an equitable basis, especially at creameries and cream stations. The grades may also be useful in providing a classification of cream according to its value for the manufacture of butter of each important market grade. In these tentative standards five United States grades for churning cream are provided.

BUTTER

The first work on quality standardization attempted by the Department in the field of dairy and poultry products had in view the establishment of a uniform basis for the grading of butter and cheese. This work was begun in 1918. At that time, standards were used in all of the important receiving markets, but the terms were variously interpreted not only in different markets but by different operators in the same market. The standards developed by the Department followed closely the established trade practice, but the grades were made much more definite and were applied uniformly in all markets by the Government graders.

The official standards for grading were promulgated under the provisions of the farm products inspection law. All research on these products has been authorized and financed under the item carried in the agricultural appropriation acts providing for investigating the marketing and distribution of farm products.

For the purposes of grading, butter is classified into six classes: (1) Dairy butter, (2) creamery butter, (3) packing-stock butter, (4) ladled butter, (5) process or renovated butter, and (6) grease butter.

The quality of all classes of butter, except packing-stock, ladled, and grease butter, is determined by definition and is indicated by a score with maximum ratings given to various quality factors as follows:

Flavor	45
Body	25
Color	15
Salt	10
Package	5
Total	100

In actual official practice, the rating of each quality factor is somewhat modified to give proper recognition to actual market requirements. Each score is considered a grade and a certain standard is required for each of the five quality factors as shown in table 1.

TABLE 1.—*Characteristics required or permitted in butter receiving certain scores*

Defined score	Flavor	Body	Color	Salt	Package
95 and above.	Desirable flavors: Fine, sweet, clean, with pleasing creamy aroma.	Perfect, firm, waxy.	Perfect light or medium.	Perfect light or medium.	Must be attractive, neat, clean, uniform, and sound.
93–94	Desirable flavors: Fine, sweet, clean. Total defects other than flavor not over ½ point.	Firm	Light or medium.	Light or medium.	Free from mold, clean, uniform, and sound.
92	Desirable flavors: Sweet and clean (slightly storage flavor in held butter). Total defects other than flavor not over 1 point.	do	Light or medium, slight curd specks or waviness.	Light or medium, well dissolved, uniform.	Clean, uniform, and sound.
91	Slight objectionable flavors, fairly sweet and fairly clean (storage flavor in held butter).	do	Light or medium, uniform, curd specks, waviness.	Light, medium, or high, well dissolved, uniform.	Do.
90	Objectionable flavors shown: Fairly sweet and fairly clean; may be flat and lacking in flavor (old flavor in held butter).	Fairly firm	Light or medium, fairly uniform, wavy.	Slightly gritty, fairly uniform.	Do.
89	Objectionable flavors permitted; reasonably sweet and reasonably clean.	Reasonably firm.	Light, medium, or high, distinct waviness.	Somewhat gritty, fairly uniform.	Uniform and sound.
88	Objectionable flavors distinctly developed; also unclean taint, musty, distinct lime or other alkaline flavors shown.	do	Slightly mottled.	May be gritty and somewhat irregular.	Do.
87	Garlic and off-flavors slightly evident.	Weak and considerably defective.	Distinctly mottled or streaked.	Gritty and irregular.	Do.
86	Garlic and off-flavors distinctly evident.	do	Very mottled, streaked, or high.	Irregular, extremely high, gritty.	Do.
85	Pronounced garlic and off-flavors.	Weak, but must be fairly solid boring.	do	do	Do.
84–83	May be slightly rancid or strong on tops and sides.	May be ragged boring.	Very mottled, streaked, or extremely high.	Extremely high, irregular, and gritty.	Do.
82–80	Rancid or strong on tops and sides.	do	do	do	Sound.
80–75	Butter containing defects of a more marked degree than specified above is given a score below 80, depending upon the extent of the defects.				

CHEESE

In the early history of the American cheese industry before modern transportation and cold-storage facilities were available, the season's production was kept in curing rooms at the factories and was not marketed until after it had been well cured.

Under present conditions, marketing methods have changed and wholesale cheese dealers in the producing sections and distributing markets have provided facilities for holding cheese during the process of curing or ripening. Accordingly, the practice of curing cheese at factories has been gradually discontinued, and cheese is now marketed by the factories and often by country dealers in a fresh or unripened state.

Commercial grading of cheese has been based chiefly upon the personal preference or opinion of the grader, and the particular requirements or preferences of certain markets have also had an influence on the grading of cheese. The finer distinctions in quality generally have been given minor consideration, and ordinarily cheese that has a firm body, either a close, medium-close, or medium-open texture, a mild or sharp clean flavor, the desired color, and good finish has been considered of "good" to "fancy" quality. The preference in body and color in various consuming markets has differed to a marked degree. In certain markets a cheese having medium-firm body and open texture can be sold more readily and at a higher price than a cheese of equal quality having a firm body and close texture.

Practically the same conditions have prevailed for color requirements of different markets. Not infrequently different prices are paid in the same market for cheese of the same quality which differs only in the degree of flavor because of the age or degree of ripening. It is obvious that, with such conditions existing, the grading certificate for a lot of cheese, to be of definite use and value to buyers and dealers, should not only state the score but also fully describe all the characteristics that determine certain market preferences, such as approximate degree of flavor (mild or sharp), color, and character of texture and body.

The quality of American Cheddar cheese is determined by definition and is indicated by a score with maximum ratings given to the various factors as follows:

Flavor	30
Body and texture	40
Finish and appearance	20
Color	10
Total	100

The following grades are recognized for American cheese: U. S. Extra Fancy, U. S. Fancy, U. S. No. 1, U. S. No. 2, U. S. No. 3, and Culls. Each grade represents a 3-point range in score, Extra Fancy scoring 95 and above, and Culls below 83. The characteristics required in cheese of certain scores or grades are shown in table 2.

TABLE 2.—*Characteristics required or permitted in cheese receiving certain scores*

Quality factor		Score 95 and above; U. S. Extra Fancy	Score 92 to 94, inclusive; U. S. Fancy	Score 89 to 91, inclusive; U. S. No. 1	Score 86 to 88, inclusive; U. S. No. 2	Score 83 to 85, inclusive; U. S. No. 3	Score below 83; Culls
Factor	Rating						
Flavor	30	Very fine clean flavor, mild or aged. Highly pleasing flavor and aroma; very fully developed and especially pleasing to the taste and smell.	Fine flavor, fresh, mild or aged; clean and desirable flavor if mild or aged and clean in flavor if fresh.	Good flavor, fresh, mild or aged; fairly clean, but may be lacking in flavor; may show slightly objectionable flavor, such as slightly developed frosted-feed, weedy, heated, barny, or cowy.	Fair flavor, fresh, mild or aged; must be reasonably clean in flavor. May show objectionable flavors such as frosted-feed, weedy, barny, cowy, or heated, or a slightly developed acidy, bitter, or fruity flavor.	Poor flavor, fresh, mild or aged. Off flavors disagreeable to the taste permitted. May show distinct acidy, bitter, sour, fruity, or unclean flavors.	Very poor flavored cheese, fresh, mild, or aged. May show pronounced off flavors, very disagreeable to the taste, such as pronounced acidy, rank, bitter, sour, fruity, stale, unclean, or rancid.
Body and texture	40	Close, medium close, or open texture. Must be smooth and silky, slightly translucent, meaty and waxy, without gas holes.	Close, medium close, or open texture. Must be good body if fresh, smooth and meaty if aged. Practically free from Swiss holes and entirely free from pin holes.	Close, medium close, or open texture. Fairly good body if fresh, fairly meaty and smooth if aged. May show a few Swiss holes but must be practically free from pin holes.	Close, medium close, or open texture. Reasonably good body if fresh and smooth if aged. Must draw a full plug. May show a few pin holes and be slightly corky, slightly crumbly, or slightly pasty.	Close, medium close, or open texture. May be defective, somewhat ragged, pasty, crumbly, corky, or gassy.	Close, medium close, or open. May be very weak, ragged, pasty, crumbly, corky, gassy, or spongy.
Finish and appearance	20	Uniform in size, perfect in shape, even, dry, closed surfaces, square edges, neat and clean, without cracks or checks, and free from mold.	Uniform in size and shape, with even, dry, closed surfaces, square edges, well dressed, neat and clean, without cracks or checks, and fairly free from mold.	Fairly uniform in size and shape, even dry surfaces, well dressed, fairly clean and sound, without cracks or checks, and reasonably free from mold.	Reasonably uniform in size and shape, fairly smooth even surfaces, reasonably dry and reasonably sound, without open cracks or rot spots in rind.	May be irregular in size and shape and show defects, such as open cracks or rind holes, soft rot spots, huffed or misshapen.	May be very irregular in size and shape and very defective, with huffed surfaces, soft rot spots, and cracks or holes in the rind.
Color	10	Uncolored or medium colored. Uniform and even and free from defect.	Uncolored or medium colored. Uniform and even.	Uncolored, medium or high colored. Fairly uniform and fairly even, with only slight waviness.	Uncolored, medium colored, or high colored. May be slightly streaked or very slightly acid cut.	May be irregular, extremely high, badly mottled, streaked, or distinctly acid cut.	May be very irregular, extremely high, very badly mottled, streaked, acid cut, or badly faded.

EGGS

Standardization of eggs is a relatively new development. Preliminary research was begun in the Department in 1921, but it was not until 1924 that an official egg-grading service was offered in New York and Chicago. The United States quality standards and grades for eggs have been developed with a view to meeting the varying needs of the different branches of the trade—buyers, wholesalers, and retailers (fig. 4).

The factors on which the quality of individual eggs is judged are shell, air cell, yolk, and white. There are four subdivisions for quality of clean, sound, shell eggs: U. S. Special, U. S. Extra, U. S. Standard, and U. S. Trade. Standards are also provided for three qualities of dirty, sound, shell eggs, namely: U. S. Extra Dirty, U. S. Standard Dirty, and U. S. Trade Dirty; and one standard for eggs with checked or cracked shells, namely: U. S. Checks.

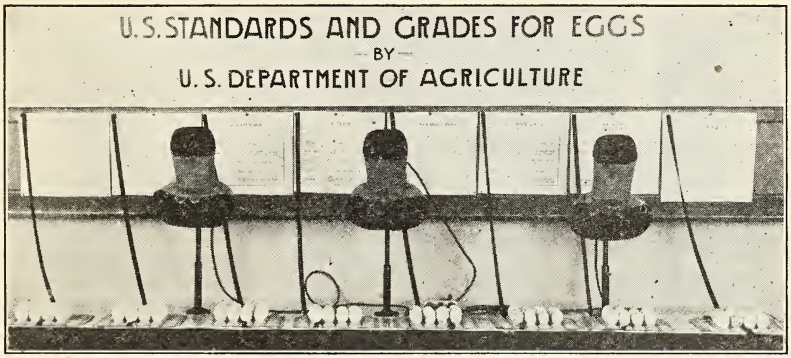

FIGURE 4.—An exhibit used to demonstrate the egg standards. A statement of the requirements of each standard quality is connected with sample eggs of that quality, with candling devices for examination of the eggs.

The essential difference between the grades used by buyers, wholesalers, and retailers, is found in the permitted range of quality and tolerances. For example, a wholesale handler of eggs buying a carload lot of U. S. Specials could not possibly secure a straight car of that exact quality. He must take some U. S. Extras and some U. S. Standards, and he must recognize the fact that in commercial candling operations mistakes in grading are inevitable and there is bound to be some loss. The wholesale grades therefore allow a greater tolerance or percentage of lower-quality eggs.

Each wholesale grade is divided into two or more subgrades, which differ from each other in the percentage requirements of each quality. For example, the wholesale grade U. S. No. 1 Special must have at least 80 percent Specials, and U. S. No. 4 Special requires only 50 percent of this quality.

Obviously a range of quality that would be satisfactory to the wholesaler would not be practical for the retailer, who must furnish the consumer with a product that is as nearly unform in quality as possible. The retail grades therefore require a minimum of 80 percent of the particular quality from which each grade takes its name.

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In addition to the names that have been given to the retail grades, Retail Grade AA may be applied to U. S. Specials, Retail Grade A to U. S. Extras, Retail Grade B to U. S. Standards, and Retail Grade C to U. S. Trades.

The United States standards for eggs are relatively new, but there has been steady progress in the direction of their adoption by the trade. They have been adopted by a number of producers' associations and are serving as a basis for official grading which is being used rather extensively by governmental agencies and other public institutions that purchase on definite specifications.

DRESSED POULTRY

Standardized grades for dressed poultry were first formulated by the Department in 1927. These were drawn up first for dressed turkeys owing to a demand for the grading of this class of poultry for the Christmas market. Immediately after, standards and grades were prepared for the other poultry classes. They are still in tentative form and subject to revision, as experience in their use is accumulated.

Use of United States standards and grades for dressed poultry has been most extensive to date with dressed turkeys. During the fall and winter of 1929 about 8,000,000 pounds of dressed turkeys were graded in accordance with these standards, both at shipping points and at terminal markets. In later years most of the grading of turkeys has been at shipping point. Some of the U. S. Prime turkeys are marked with their grade in such a manner that the grade designation is carried through to the consumer whose reaction to this grading has been very favorable. Dressed poultry is also being graded in considerable quantities at a number of terminal markets and at shipping point for commercial use and for Government departments, on the basis of United States standards and grades.

In addition to the common main classes of poultry recognized in the United States standards, namely, chickens, turkeys, ducks, guineas, and squabs, other classes or subclasses are provided. These main classes are subdivided according to age and sex; according to whether scalded, semiscalded, or dry picked; whether drawn or undrawn; whether milk fed or grain fed; whether fresh dressed, fresh hard chilled, or frozen; whether dry packed or ice packed; and according to weight. For example there are dry-picked young tom turkeys, semiscalded milk-fed broilers, ice-packed scalded fowl and frozen young ducks.

Four United States standards of quality applicable to individual birds are provided for most of the subclasses of poultry. These in the order of their quality are known as U. S. Special or Grade AA, U. S. Prime or Grade A, U. S. Choice or Grade B, and U. S. Commercial or Grade C; United States grades of the same names are provided for carcasses as commercially packed.

The principal factors taken into consideration in determining the quality of individual birds are fleshing condition, workmanship in dressing, condition of crop, and freedom from deformities and broken bones. In the highest quality, the carcasses must be full fleshed—that is, fully covered with flesh and fat. They must be

well bled, free from pinfeathers and skin tears or other dressing defects, and from deformities or broken bones. As the quality lowers in each successive standard, the fleshing may be less complete, and dressing defects and deformities of increasing seriousness are allowed. In connection with the United States grades for dressed poultry, weight specifications for individual birds and for packages of a dozen birds are suggested. Code words are provided to make easy and economical the designation by wire of specific classes, qualities, and weights of dressed poultry.

LIVE POULTRY

Tentative United States standards and grades for live poultry have recently been formulated. For the purpose of applying these standards, live poultry is divided into various classes, subclasses, and weight classifications. To each of these, three grades may be applied.

The tentative United States standards for grades for live poultry are intended for application to the grading of live poultry as it is received from producers, in order that a suitable and equitable price differential may be applied at that point. They are also intended for application to live poultry at terminal markets when the poultry is sold to slaughterers.

FRUITS, VEGETABLES, AND RELATED PRODUCTS

FRESH FRUITS AND VEGETABLES

The need for national standards for fruits and vegetables was forcibly drawn to the attention of the Department in 1915 through the inauguration of a telegraphic market news service. It was obvious that unless the prices quoted were based on products of comparable quality no particular significance could be attached to price variations in the different markets. A staff of specialists was immediately assigned to the problem of formulating practical grades for the country as a whole.

The United States standards for potato grades were recommended by the United States Department of Agriculture for voluntary use in 1917, and in 1918 they were made compulsory by the United States Food Administration for all licensees. As these licensees comprised practically the whole produce trade of the country, the United States potato grades became the sole basis of trading for the remainder of 1918, after which time the Food Administration ceased to function.

A further and more permanent impetus was given to the national use of standards for fruits and vegetables through the inauguration of the farm-products inspection service in the important distribution centers. The recommended standards of the Department became invaluable as a basis of reporting the grade and quality of products arriving in these markets. The use of the standards was greatly increased in 1922 by the extension of the inspection service to points of origin.

So far as Federal requirements are concerned, the use of the United States grades for fruits and vegetables is wholly optional. The research and recommendations have been authorized by the various agricultural appropriation acts. The United States grades for potatoes and barreled apples have been promulgated by the Secretary of

Agriculture as official standards for use in connection with the farm products inspection service. They have been widely adopted as the official standards in the various States, and in some cases their use has been made compulsory.

The terminology used in fruit and vegetable grading has been placed on a numerical basis with the exception of a certain premium grade provided for products of exceptional quality, which has been designated U. S. Fancy, and a U. S. Commercial grade for that quality of product that is better than a U. S. No. 2 but not so good as U. S. No. 1. The U. S. No. 1 grade is in all cases intended to include the major portion of the commodity that has customarily met the requirements of the best commercial grade (fig. 5).

In general, the following factors are considered in determining the grade: (1) Variety; (2) market quality, based on the state of maturity, general appearance, including desirability of shape and

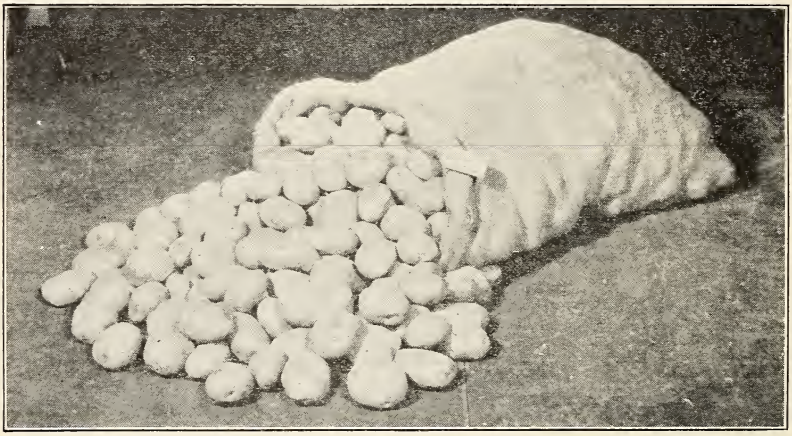

FIGURE 5.—A sack of U. S. No. 1 potatoes.

color and relative freedom from such defects as cause waste or unreasonable deteriorations; and (3) size.

In trading in these products it is necessary for buyers and sellers to specify either the specific variety, as "Winesap apples", or the type, as "round white potatoes." In some grades the minimum size of the product is specified, but where this is not the case the specifications must be stated in addition to grade as "Winesap apples, U. S. No. 1, 2½ inches minimum."

The list of fresh fruits and vegetables for which Federal grades have been recommended has grown rapidly and is being extended to cover all such products moving in carload lots. Standards have now been established for 51 fruits and vegetables. In the case of onions, for instance, separate standards have been established for Bermuda onions, Creole onions, and northern-grown onions. Other similar cases raise the total number of sets of standards now devised for fruits and vegetables to 70 in 1935.

Table 3, which shows the specifications of the official standards for potatoes, illustrates a typical set of grades.

TABLE 3.—*Official standards for potatoes*

Grade	Characteristics	Requirements					Tolerance for defects	Tolerance for size
		Freezing injury, blackheart, soft rot, or wet breakdown	Shriveling, sprouting, hollow heart	Dirt, other foreign matter	Sunburn, second growth, growth cracks, air cracks, cuts, scab, blight, dry rot, rhizoctonia, other disease, insects or mechanical or other means	Size		
U.S. Fancy	1 variety, firm, mature, bright, well shaped	Free from	Free from	Free from injury.	Free from injury.	2 inches minimum and for long varieties at least 40 percent, 6 ounces or larger in weight, and for round or intermediate-shaped varieties at least 60 percent, 2¼ inches or larger in diameter.	6 percent total defects including 1 percent soft rot or wet break-down.	3 percent below specified minimum. 15 percent above specified maximum. When a percentage is specified of certain size and larger, 15 percent in individual containers may be below specified percentage, provided average for lot is within specified percentage.
U. S. No. 1	Similar varietal characteristics, fairly well shaped.	do	Free from damage.	Free from damage.	Free from damage	1⅞ inches unless otherwise specified. (See Size Classification.)	5 percent damage by hollow heart, 6 percent total other defects including 1 percent soft rot or wet breakdown.	5 percent below any specified minimum except 3 percent for size A. 15 percent above any specified maximum. When a percentage is specified to be of a certain size and larger, 15 percent in individual containers may be below the specified percentage provided the average for the lot is within the percentage specified.
U. S. Commercial.	do	do	do	Free from serious damage.	do	do	20 percent *total* defects, 5 percent serious damage by hollow heart, 6 percent remaining requirements of No. 2 grade including 1 percent soft rot or wet break-down.	Do.
U. S. No. 2	Similar varietal characteristics.	do	Free from serious damage by shriveling and hollow heart.	do	Free from serious damage.	1½ inches unless otherwise specified. (See Size Classification.)	5 percent serious damage by hollow heart, 6 percent total other defects including 1 percent soft rot or wet break-down.	Do.

NOTE.—Unclassified shall consist of potatoes which are not graded in conformity with any of the foregoing grades.

SIZE CLASSIFICATION FOR U. S. NO. 1, U. S. COMMERCIAL, AND U. S. NO. 2 GRADES OF POTATOES

Size A.—Long varieties, 1⅞ inches minimum with not less than 40 percent, 6 ounces or larger in weight.

Round and intermediate varieties.—1⅞ inches minimum with not less than 60 percent, 2¼ inches or larger in diameter.

Size B.—All varieties, ranging from 1½ to not over 2 inches.

Other sizes.—It is permissible to specify any other sizes in connection with the grade statement.

NOTE.—It is not permissible to use size A or size B in connection with U. S. Fancy grade but other sizes may be specified in connection with this grade providing they are not lower than the minimum requirements specified in the grade.

All percentages shall be calculated on the basis of weight.

APPLICATION OF TOLERANCES

The tolerances specified for the various grades shall be placed on a container basis. However, any lot of potatoes shall be considered as meeting the requirements of a specified grade if the entire lot averages within the tolerances specified, provided that the defects in any container based on sample inspection do not exceed the following amounts: For a specified tolerance of 10 percent or more, not over one and one-half times the tolerance is allowed for any one container. For a specified tolerance of less than 10 percent not over double the tolerance is allowed for any one container.

DEFINITIONS OF TERMS IN POTATO STANDARDS

(1) "Fairly well shaped" means that the potato is not so pointed, dumbbell-shaped or otherwise ill-formed that its appearance is materially injured.

(2) "Soft rot or wet break-down" means any soft, mushy, or leaky condition of the tissue such as slimy soft rot, leak, or wet break-down following freezing injury or sunscald.

(3) "Damage" means any injury or defect which materially injures the appearance of the individual potato or the general appearance of the potatoes in the container, or which cannot be removed without a loss of more than 5 percent of the total weight of the potato. Loss of outer skin (epidermis) shall not be considered as damage unless the skinned surface is materially affected by very dark discoloration. Any one of the following defects or any combination of defects the seriousness of which exceeds the maximum allowed for any one defect shall be considered as damage:

(*a*) Dirt when the general appearance of the potatoes in the container is more than slightly dirty or stained, or when individual potatoes are badly caked with dirt or badly stained; or other foreign matter which materially affects the appearance of the potatoes.

(*b*) Second growth or growth cracks which have developed to such an extent as to materially injure the appearance of the individual potato or the general appearance of the potatoes in the container.

(*c*) Air cracks which are deep, or shallow air cracks which materially injure the appearance of the individual potato or the general appearance of the potatoes in the container.

(*d*) Shriveling when the potato is more than moderately shriveled, spongy, or flabby.

(*e*) Sprouting when more than 10 percent of the potatoes have sprouts over three-fourths of an inch long.

(*f*) Surface scab which covers an area of more than 5 percent of the surface of the potato in the aggregate.

(*g*) Pitted scab which affects the appearance of the potato to a greater extent than the amount of surface scab permitted or causes a loss of more than 5 percent of the total weight of the potato.

(*h*) Rhizoctonia when the general appearance of the potatoes in the container is materially injured or when individual potatoes are badly infected.

(4) "Diameter" means the greatest dimension at right angles to the longitudinal axis. The long axis shall be used without regard to the position of the stem (rhizome).

(5) "Serious damage" means any injury or defect which seriously injures the appearance of the individual potato or the general appearance of the potatoes in the container, or which cannot be removed without a loss of more than 10 percent of the total weight of the potato. Any one of the following defects or any combination of defects the seriousness of which exceeds the maximum allowed for any one defect shall be considered as serious damage.

(*a*) Dirt when the general appearance of the potatoes in the container is seriously affected by tubers badly caked with dirt; or other foreign matter which seriously affects the appearance of the potatoes.

(*b*) Cuts when both ends are clipped or when more than an estimated one-fourth of the potato is cut away from one end or when the remaining portion of the clipped potato weighs less than 6 ounces. Other cuts which seriously affect the appearance of the individual potato or which cannot be removed without a loss of more than 10 percent of the total weight of the potato.

(*c*) Shriveling when the potato is excessively shriveled, spongy, or flabby.

(6) "Mature" means that the outer skin (epidermis) does not loosen or "feather" readily during the ordinary methods of handling.

(7) "Bright" means practically free from dirt or other foreign matter, and that the outer skin (epidermis) has the attractive color normal for the variety.

(8) "Well shaped" means the normal shape for the variety and that the potato is not pointed, dumbbell shaped, excessively elongated, or otherwise ill-formed.

(9) "Injury" means any defect which more than slightly affects the appearance of the individual potato or the general appearance of the potatoes in the container, or which cannot be removed without a loss of more than 2 percent of the total weight of the potato.

The operation of the farm products inspection service at shipping points has proved of exceptional value in testing the practicability of new grades. Not only has it afforded an opportunity to apply

the grades on a commercial basis to a large volume of the various products, but in each case the actual application of the grades has been made by trained inspectors working under close supervision. During the fiscal year ended June 30, 1934, a total of 318,215 cars were inspected in cooperation with various State agencies. Most of these shipments were certified on the basis of Federal standards (fig. 6).

In 1934, 45 States had promulgated one or more sets of United States grades for fruits and vegetables as the official State standards.

PRODUCTS FOR CANNING

During the last 10 years there has been an ever-increasing demand for Federal standards to be used by canners as a basis for contracting with growers for their raw products. As a result of this demand

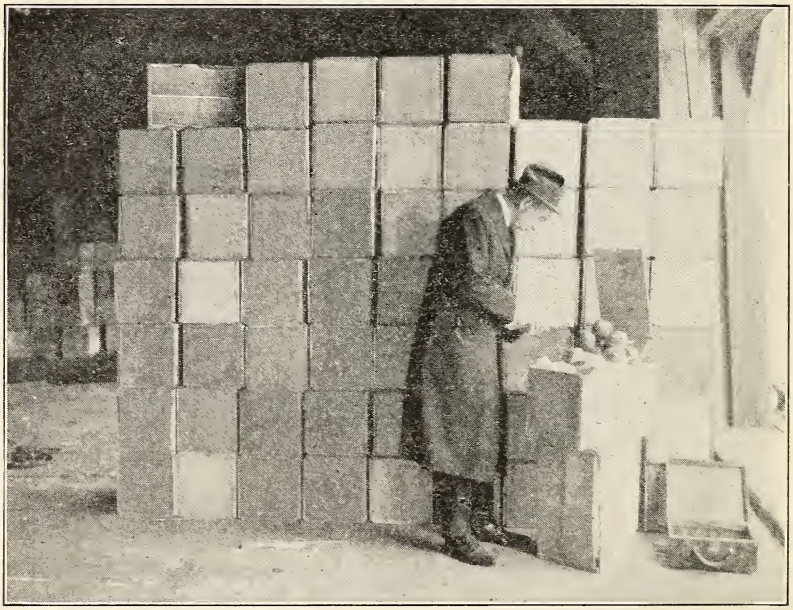

FIGURE 6.—A Federal inspector examining boxed apples at receiving market.

standards have been recommended for the following cannery raw products: Tomatoes for canning, tomatoes for manufacture of strained tomato products, spinach, sweet corn, apples, sour cherries, strawberries, and cabbage for sauerkraut manufacture. The practicability of the use of such standards has been thoroughly demonstrated, as evidenced by their widespread adoption. The revised standards for canning tomatoes were recommended in 1926 and they are now being used by many canners in 13 States.

Canning products are not usually sorted by the growers into different qualities. The culls are removed and the remainder is delivered to the cannery where the percentage of each grade is determined by inspection. This refers to the practice when official grades are used.

CANNED FRUITS AND VEGETABLES

The development of standards for canned fruits and vegetables was undertaken in 1926 when canned foods were included as storable commodities under the United States Warehouse Act.

The grades were originally developed with the view to affording a basis on which loans might be made while the canned foods were in storage awaiting marketing. To serve this purpose well, they must reflect current trade conceptions of the various qualities of canned foods. Since such products are in the finished state when warehoused, they must also reflect consumer needs. The grades as now drawn are believed not only to represent a reasonable basis on which commercial trading may be predicated but to afford suitable nomenclature for consumer labeling. They have also been found suitable as a basis for purchasing by large consumer organizations such as municipal, county, and State governments. In some instances, these organizations have developed a plan whereby official graders of the Bureau of Agricultural Economics inspect and grade "bid" samples which accompany proposals made at the time the contracts are awarded; the graders also grade samples taken from the delivery of the successful bidder to ascertain whether the goods are of the grade purchased.

Future trading in canned corn, tomatoes, peas, and snap beans, recently inaugurated in one of the large eastern markets is based on the United States grades for these commodities.

For the more important canned fruits and vegetables, three grades above Substandard (low quality, but not illegal) have been described. These are U. S. Grade A (Fancy), U. S. Grade B (Extra Standard or Choice), and U. S. Grade C (Standard). Grade A refers to the finest or best grade. Grade B describes high-grade food which may be lacking in some of the quality characteristics of the highest grade. Grade C is good food and as satisfactory for many purposes as the next higher grade. In practically all of the grades, a scoring system has been included which is a part of each grade. The scoring system affords a convenient basis on which to appraise the qualities of canned products, and after a little practice it can be readily used by canners, distributors, and consumers. Samples may be officially graded by official canned fruit and vegetable graders upon request by financially interested parties.

PEANUTS

Official standards for white Spanish, Georgia runners, and Virginia-type peanuts have been in successful use for many seasons.

The standards for farmers' stock have been used chiefly as a basis for the statement of grade on warehouse receipts and in purchases of white Spanish and Georgia runners. The factors that determine the grade are maturity, dryness, and freedom from damage, together with the percentage of sound mature kernels as determined by a cracking test.

The standards for shelled white Spanish and Georgia runner peanuts have been adopted by the Southeastern Peanut Association and are used as the basis for arbitration and adjustments.

The U. S. No. 1 grade of shelled peanuts applies to whole peanuts that are not badly shriveled, contain no unshelled or damaged stock,

and are free from foreign material. No noticeably discolored stock is allowed in the white Spanish or shelled Virginia-type peanuts. In addition to these requirements the U. S. Extra Large and the U. S. No. 1 Virginias contain a specified number of kernels per pound.

The established grades for cleaned Virginia-type peanuts which are peanuts sold in the shell are U. S. Jumbo, U. S. Fancy, and U. S. Extra Hand Picked. The factors determining these grades are: Maturity; dryness; empty or practically empty shells; discolored, cracked, or broken shells; freedom from foreign matter, unshelled kernels, damaged kernels; and size and number of peanuts per pound.

The United States grades for shelled white Spanish, runner, and Virginia-type as well as those for cleaned Virginia-type peanuts have been used extensively in receiving markets as a basis for official inspection by the United States farm products inspection service. An average of 906 cars have been certified as to grade during the last 4 years.

HONEY

In spite of the economic importance of the honey industry, little has been done thus far to secure the effective application of uniform standards on a Nation-wide basis.

The first research of the Department regarding honey standardization was conducted jointly by the Bee Culture Laboratory of the Bureau of Entomology and the Bureau of Agricultural Economics, and had as its objective the adoption of color standards for extracted honey. A scientific analysis was made of honey samples from all parts of the country, and a technical basis was thus provided for describing the various gradations of color. After many unsuccessful attempts, a practical grader, extremely simple in principle and operation, was developed, which permitted the following color classifications: Water White, Extra White, White, Extra Light Amber, Light Amber, and Amber. The color of darker honey is of little commercial importance. The recommended standards of the Department which were revised in 1933 include, in addition to color, specifications as to clearness, cleanness, density, flavor, and odor.

Grades have also been formulated for comb-section honey, shallow-frame comb honey, wrapped cut comb honey, and for chunk or bulk comb honey packed in tin. The factors determining the grade of comb honey are: Surface color and weight of the comb, firmness of attachment of the comb to the section, freedom from pollen cells or damage caused by granulation, honey-dew, or any objectionable flavor or odor. There are also requirements as to the color of the section, and freedom from any injury that would result in leaky or weeping combs.

The United States honey standards are the usual basis of inspection under the provisions of the farm products inspection law. The recommendations have met with general approval from the industry, but the task of securing their effective application in actual commercial operations lies ahead except in a few localities.

CONTAINERS FOR FRUITS AND VEGETABLES

Standard containers for marketing fruits and vegetables are of more interest to the average citizen than he generally realizes. He

is at all times a consumer of some commodity and may be a grower or shipper of other commodities, a manufacturer of containers, or an official of a railroad, steamship line, or other carrier. As a consumer he may be defrauded by the substitution of short-measure packages at the full-measure price. The cost of marketing is increased by the greater expense of manufacturing a large number of styles and sizes and by breakage in transit, which may be due to weak packages, to improper stowage, or to the difficulty of loading odd-sized containers.

Standardization means to the manufacturer that production is simplified and that he can concentrate on a few sizes, with consequent lowering of costs. To the carrier it means the elimination of many sizes that now complicate the problem of damage in transit, and it narrows the container problem to a few sizes for which standard strength specifications can be worked out and approved methods of stowing and bracing devised. The grower or shipper benefits by any action that lowers the cost of manufacture and tends to reduce breakage in transit. In addition, standard containers provide him with a definite basis of sale so far as the size of his package is concerned. He is thus relieved of unfair competition through use by his competitor of a short package.

Three Federal laws have made certain standard containers compulsory for the marketing of fruits and vegetables. These are the United States Standard Barrel Act and the Standard Container Acts of 1916 and 1928.

The first of these, the Standard Barrel Act, passed in 1915, established the standard fruit barrel of 7,056 cubic inches and its subdivisions, and the standard cranberry barrel of 5,826 cubic inches and its subdivisions. The standard fruit and vegetable barrel, which is ordinarily supposed to contain 3 bushels, actually holds 9 quarts in excess of that quantity. In establishing this standard, theoretical considerations were laid aside and the same dimensions and capacity as those of the flour barrel were adopted. The standard cranberry barrel was designed to hold 100 pounds of cranberries. The subdivisions of both barrels are three-quarter barrel, one-half barrel, and one-third barrel. The Standard Barrel Act is enforced by the Bureau of Standards of the United States Department of Commerce, and in those States that have legally adopted the Federal standard by the local sealers of weights and measures. The law has been reenacted by at least 17 States and by the District of Columbia.

The Standard Container Act of 1916 established three standard sizes and the dimensions of Climax baskets of 2, 4, and 12 quarts capacity, and standard berry boxes and till baskets containing dry one-half pint, dry 1 pint, dry 1 quart, and multiples of the dry quart. A large number of unnecessary sizes of these containers was eliminated by this act, the reductions amounting to 82, 84, and 93 percent for berry boxes, till baskets, and Climax baskets, respectively (fig. 7). This simplification of sizes has improved marketing conditions for the produce shipped in these containers because there is now no question as to the size of the containers. It works to the benefit of growers, shippers, and consumers. To the manufacturer it has meant a reduction in the number of sizes and shapes necessary to supply his customers, the possibility of making up stock in

advance of orders, and an extension of his market, because the containers which he now makes are standard the country over.

The material benefits accruing from the Standard Container Act of 1916 resulted in a demand for and the ultimate passage in 1928 of the second Standard Container Act. This act fixes the standard sizes of hampers and round stave baskets, including the type known as "straight side" or "tub" baskets, and splint baskets. Nine standard sizes of hampers and round stave baskets are provided—⅛, ¼, ½, ⅝, ¾, 1, 1¼, 1½, and 2 bushels. Splint baskets are standardized in six sizes of 4-, 8-, 12-, 16-, 24-, and 32-quart capacity.

In addition to establishing standard sizes of these containers the act of 1928 provides that the containers shall not be of deceptive

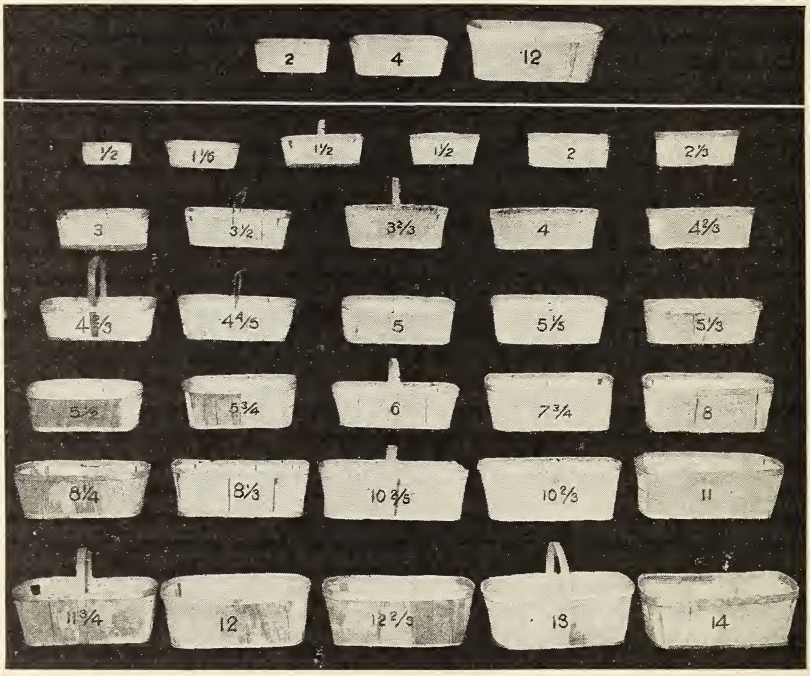

FIGURE 7.—Above, 2-, 4-, and 12-quart Climax or grape baskets. Shipments of other sizes in interstate trade are prohibited by law. Below, 31 types of Climax baskets in general use in 1917, before the establishment of standards.

appearance. It requires manufacturers to submit to the Secretary of Agriculture for approval the specifications for each container to be manufactured and directs that such specifications shall be approved providing containers made in accordance therewith are of proper cubical capacity and are not deceptive in appearance. Under this provision the specifications for each size must necessarily be held within restricted limits of variation to provide the desired differentiation in the large number of standard sizes. This regulation has resulted in a large degree of uniformity in the dimensions and shape of each standard size.

The dry quart with its subdivisions and multiples is a satisfactory basis for standardizing such small containers as the berry box and

small till basket. The larger containers have been standardized on the basis of the standard bushel of 2,150.42 cubic inches, which has been commonly known and referred to as the Winchester bushel.

Some confusion has always existed as to what constitutes a bushel, as evidenced by the terms "struck bushel", "heaped bushel", and "weight bushel." The last two are arbitrary standards, varying in different localities, and their use was one of the causes of the unsatisfactory conditions that formerly prevailed. In establishing the standard bushel of 2,150.42 cubic inches, struck measure, the act of 1928 definitely disposes of both of those spurious standards as far as fruits and vegetables are concerned, since the law has been construed as making inoperative the State laws that establish weights per bushel so far as they affect fruits and vegetables packed in containers standardized by the act. Having been enacted under the weights and measures provisions of the Constitution, the act applies with equal force to intrastate and interstate transactions.

The fallacy of the "heaped bushel" is easily demonstrated. A standard unit of measure should be permanent, definite, and of fixed and uniform value. In those States in which an attempt has been made to define a heap, the phraseology is vague and indefinite. It has been referred to as a cone, the base being the top of the measure and the height depending on the nature of the article when "piled as high as may be without special effort or design." Under this definition such vegetables as sweetpotatoes might be piled so high that the heap would be as large as the measure itself. In certain States dealers have provided themselves with measures of smaller diameter. Obviously, the smaller the diameter of the measure the smaller the heap. When packages are closed for shipping, the conical heap must necessarily be eliminated. The State of New York recognized these objections and repealed its laws requiring certain commodities to be sold by heaped measure before the act of 1928 was passed.

The "weight bushel" is inapplicable to fruits and vegetables because the weight of such products varies with the variety, size, condition, and tightness of pack and fill—that is, whether the package is slack filled, level full, or heaped. The lack of agreement as to what constitutes proper legal weights is illustrated by the wide variations in the "legal weights per bushel" of fruits and vegetables established by the several States. Massachusetts was among the first of several States to recognize the fallacy of legal weights per bushel for fruits and vegetables. In 1922 that State repealed its weight-per-bushel laws and substituted therefor a provision that sales of such products shall be by actual weight or numerical count except when sold in the original standard container.

Perishable commodities must be handled with all possible dispatch. The sale and distribution of fruits and vegetables have been facilitated and expedited by the standard containers thus far established. However, for a large portion of the country's perishable farm products, types of containers not yet standardized are used. It is believed that many economies in the marketing of the fruits and vegetables packed in those containers—cartons, crates, and boxes—could be effected through their standardization. Some consideration has been given to legislation having that end in view.

GRAIN

Grain grading has developed over a period of 80 years. For the greater part of this time the utmost confusion existed in the trade because there was no uniformity of grades or of their application. The leading grain-producing States had grades, and in addition many boards of trade and chambers of commerce adopted their own grades and controlled the grading of incoming and outgoing shipments. The diversity of opinions regarding moisture content, for instance, serves to illustrate the nature of the difficulties that were constantly arising. This factor is of great importance in grading grain, for upon the degree of dryness more than anything else depends the keeping quality in storage and transit. The terms then in use such as dry, reasonably dry, damp, and wet, were susceptible of various definitions and meant one thing to the buyer and another to the seller. Investigations of the Department of Agriculture revealed that hard winter wheat showing 15 or 16 percent moisture was being certified as dry, with the result that complaints were coming from grain exchanges and American consuls in European countries to the effect that wheat from the United States was arriving in a heated, musty, and damaged condition.

The sentiment of the grain trade finally crystallized in favor of the establishment of national standardized grades, with the result that in 1916 the United States Grain Standards Act was passed by Congress. For a number of years prior to this time standards for corn and wheat had been a subject of departmental research. It was therefore possible to establish official standards for shelled corn, effective December 1, 1916, and to establish standards for winter and spring wheat during the following summer.

The original standards have been amended from time to time to meet more exactly the requirements of the industry. During the year 1934 a complete revision was made in the standards for wheat, corn, oats, Feed Oats, Mixed Feed Oats, barley, rye, and grain sorghums. At the same time new standards were promulgated for Mixed Grain and flaxseed. The revisions were designed to bring the standards up to date in the light of present-day commercial practices and to direct attention to superior or premium qualities in certain of the grains such as heavy and extra-heavy oats, barley suitable for malting purposes, etc.

In addition to the standards mentioned above which were promulgated under the authority contained in the Grain Standards Act, research has been carried on in the grading of rough, brown, and milled rice under the general investigational and inspection authority of the Department. As a result official standards for rough rice, brown rice, and milled rice have been promulgated by the Secretary of Agriculture and have been used extensively in an inspection service set up under Federal-State auspices in the surplus rice-producing States.

Generally speaking, the factors that determine the commercial grade of grain are percentage of moisture content, pounds test weight per bushel, percentage of foreign material, percentage of damaged kernels, percentage admixtures of other grains or other classes of the same kind of grain, and "condition"—that is, whether the grain is cool and sweet or whether it is musty, sour, heating, or

hot. These are the principal factors for measuring the value of grain for commercial trading purposes, all of which are summed up in the respective grade designations of the official standards for grain.

For standardization purposes grains are divided into classes and in some cases into subclasses. For example, wheat falls into seven classes as follows: Hard Red Spring wheat, Durum wheat, Red Durum wheat, Hard Red Winter wheat, Soft Red Winter wheat, White wheat, and Mixed wheat. In each of these classes except Red Durum wheat and Mixed wheat there are two or more subclasses.

The official grain grades are designated by number, accompanied by the name of the class or subclass. There are five numerical grades of wheat and an additional grade, known as Sample grade, which is provided for off-grade grain that is usually sold subject to inspection of the buyer. Table 4 showing grades for Hard Red Spring wheat is typical.

TABLE 4.—*Class I, Hard Red Spring wheat: Grade requirements for (a) Dark Northern Spring, (b) Northern Spring, (c) Red Spring*

Grade No.	Minimum test weight per bushel	Maximum limits of—					
		Damaged kernels (wheat and other grains)		Foreign material		Wheats of other classes	
		Total	Heat-damaged	Total	Matter except other grains	Total	Durum and/or Red Durum
	Pounds	*Percent*	*Percent*	*Percent*	*Percent*	*Percent*	*Percent*
1 Heavy [1]	60	2	0.1	1	0.5	5	2
1	58	2	.1	1	.5	5	2
2	57	4	.2	2	1.0	10	3
3	55	7	.5	3	2.0	10	5
4	53	10	1.0	5	3.0	10	10
5	50	15	3.0	7	5.0	10	10
Sample grade	Sample grade shall include wheat of the subclass Dark Northern Spring, or Northern Spring, or Red Spring, which does not come within the requirements of any of the grades from No. 1 Heavy to No. 5, inclusive; or which contains more than 16 percent of moisture, or more than 10 percent of cracked kernels; or which contains inseparable stones and/or cinders; or which is musty, or sour, or heating, or hot; or which has any commercially objectionable foreign odor except of smut or garlic; or which contains a quantity of smut so great that any one or more of the grade requirements cannot be applied accurately; or which is otherwise of distinctly low quality.						

[1] Applies to each of the subclasses Dark Northern Spring, Northern Spring, and Red Spring.

Special grades are provided for Tough wheat (that is, wheat containing moisture in a quantity considered excessive for safe storage), Smutty wheat, Garlicky wheat, Weevily wheat, Ergoty wheat, and Treated wheat. In applying these special grades the wheat is graded in the usual way and thereafter the special grade designation which may be applicable is added, for example, No. 1 Dark Northern Spring, Smutty.

In the case of wheat, rye, barley, grain sorghums, and flaxseed the standards provide for a dockage system whereby foreign material that can be readily removed by the use of appropriate cleaning devices is separated from the grain before many of the other grading

tests are performed. The dockage present is calculated by weight in terms of percentage and a statement of the quantity of assessed dockage is added to the grade designation.

Dockage in wheat includes sand, dirt, weed seeds, weed stems, chaff, straw, grain other than wheat, and any other foreign material that can be removed readily from the wheat by the use of appropriate sieves and cleaning devices; also undeveloped, shriveled, and small pieces of wheat kernels removed in properly separating the foreign material, and that cannot be recovered by properly rescreening or recleaning.

After the preparation and establishment of grain standards there still remains the task of securing their correct and uniform application by inspectors. This calls for additional instructions and

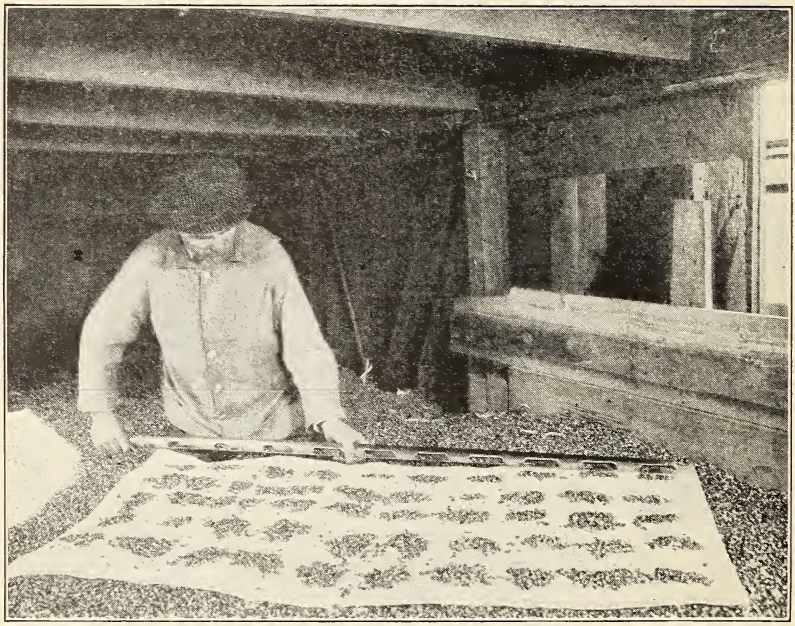

FIGURE 8.—Obtaining a representative sample of grain from car for inspecting and grading the grain.

regulations governing the methods and bases of determinations (fig. 8). The wheat standards contain the following provisions:

Each determination of dockage, temperature, odor, garlic, and live weevils or other insects injurious to stored grain shall be on the basis of the grain as a whole. All other determinations shall be on the basis of the grain when free from dockage.

In addition, interpretative opinions, accompanied by practical examples illustrating the particular point involved, are issued from time to time by the Board of Review, a body constituted for the purpose, regarding those factors which are determined not by mechanical apparatus but by the exercise of individual judgment and concerning which there may be room for honest differences of opinion between experienced and well-informed grain specialists.

An outstanding development in the merchandising of wheat is the important part that protein determination has assumed in recent years. The test for protein is not one of the factors of the wheat standards. The services of a trained chemist are required to make the determination, which is regarded as an adjunct or supplement to present-day commercial grain inspection and grading. The Department of Agriculture has not set up a Federal service for protein testing, but its research chemists have taken an active part in the standardization of methods, equipment, and technic, with a view to bringing about a closer uniformity of results on the part of private chemists, State chemists, and chemists of boards of trade, now performing the test for commercial transactions.

The administration of the Grain Standards Act, under general supervision from Washington, is directed by General Field Headquarters at Chicago, through Pacific Coast Field Headquarters at Portland, Oreg., through 40 Federal grain supervision and 5 branch offices.

HAY AND RELATED PRODUCTS

HAY

For a number of years the acts of Congress making appropriations for the Department of Agriculture have authorized the Secretary of Agriculture to acquire and diffuse among the people of the United States useful information on subjects connected with the grading of farm products and to establish an inspection service for certain farm products. Under the above authority hay standardization studies were begun in the Bureau of Agricultural Economics in 1920. Representative samples of baled hay of various kinds were obtained from shipping points and markets for examination and laboratory study. Standards were recommended for Timothy, Clover, and Grass hay on January 2, 1923 and were revised February 1, 1924. Standards for Alfalfa and Alfalfa Mixed hay, Prairie hay, Johnson and Johnson Mixed hay, and Mixed hay were recommended on July 1, 1925, and the standards for Timothy, Clover, and Grass hay were revised slightly on the same date. On September 1, 1925, the Secretary of Agriculture made these standards the official standards of the United States for the inspection and certification of such hays. After two seasons of practical experience with the official standards in a number of terminal markets and shipping points, a few minor revisions and additions were made to complete a set of national standards that were made official and effective July 1, 1927. Further minor revisions were made in these standards effective November 1, 1929, and tentative standards for Soybean and Soybean Mixed hay were announced in November 1928.

Standards for straw (Wheat, Oat, Barley, Rye, and Rice straw), were made effective July 1, 1932. The standards for Timothy and Clover hay; Alfalfa and Alfalfa Mixed hay; Prairie hay; Johnson and Johnson Mixed hay; Grass hay; Mixed hay and straw were revised slightly on January 2, 1933, and official standards for Grain, Wild Oat, Vetch, and Grain Mixed hay; and Soybean and Soybean Mixed hay were made effective. Tentative standards for Lespedeza and Lespedeza Mixed hay were recommended in November 1934.

The official hay standards of the United States now comprise standards for eight major groups of hay: Group 1, Timothy and Clover hay; group II, Alfalfa and Alfalfa Mixed hay; group III, Prairie hay; group IV, Johnson and Johnson Mixed hay; group V, Grain, Wild Oat, Vetch, and Grain Mixed hay; group VI, Soybean and Soybean Mixed hay; group VII, Grass hay; and group VIII, Mixed hay. These groups do not include grain straw and the straw of hay plants threshed for seed. For the purposes of the standards, hay is confined to cured forage that is specifically classified and described in each group, which has recognized feeding value, which is not coarse and woody, and which does not contain more than 35 percent of foreign material.

These groups, with the exception of Grass hay and Mixed hay, are based on the combinations of various kinds of hay commonly found in association in the chief areas of production and the chief markets of the United States. Timothy and clover hays, for example, belong in one group because such kinds of hay are grown in quantity in the same geographic regions and often in mixtures with each other. The groups Alfalfa and Alfalfa Mixed hay; Johnson and Johnson Mixed hay; Grain, Wild Oat, Vetch, and Grain Mixed hay and Soybean and Soybean Mixed hay are founded on similar conditions and facts.

Grass hay is hay in which the grasses other than timothy, Johnson grass, upland and midland prairie grasses, grain cut for hay, cane, millet or Sudan grass strongly predominate, thus giving the hay a grassy appearance.

Mixed hay comprises combinations of the various kinds of hay included in United States standards that are not as definitely recognized in hay-marketing practices as the combinations specified in the various classes of hay in groups I, II, III, IV, V, VI, and VII.

Each of the groups, Timothy and Clover hay; Alfalfa and Alfalfa Mixed hay; Prairie hay; Johnson and Johnson Mixed hay; Grain, Wild Oat, Vetch, and Grain Mixed hay; Soybean and Soybean Mixed hay; Grass hay and Mixed hay in the official United States standards, and the tentative standards of Lespedeza and Lespedeza Mixed hay has its classes and grades.

In all the United States hay standards the term "class" is used to describe the kind of hay or the mixtures of various kinds, and has no reference whatever to quality or condition. Class names, such as Timothy, Clover, Alfalfa, Timothy Light Clover Mixed, etc., are as descriptive of the kinds and mixtures of hay as necessary terseness will permit. The first word in each class name usually indicates the kind of hay that predominates in that class. Succeeding words, if any, in the class names indicate the kind of hay mixed with the predominating kind and whether the mixture is comparatively light or in a quantity too great to be considered as a light mixture. The following example will serve to illustrate the descriptive character of the class names. The class name, Timothy Light Clover Mixed, plainly describes a hay mixture in which the timothy predominates and in which the clover portion is of minor importance.

Each class of hay in the United States standards is based upon definite specifications for the mixtures permitted as shown in the

column entitled "Mixture percentages." The class specifications must be interpreted through the definitions accompanying the standards for each group in order to understand fully the class requirements. For example, the words, "timothy", "clover", "grasses", "alfalfa", etc., appear constantly in the class specifications, and for the purposes of these standards these words are accurately defined under the definitions in the official standards and the tentative standards for Lespedeza and Lespedeza Mixed hay.

The various classes of hay in United States standards have been designed to include the well-defined kinds and mixtures of hay that are of chief commercial importance in the United States. The great majority of hay markets and shipping points, considered separately, can make use of but a few of these hay classes, because a class of hay such as Alfalfa Light Johnson Mixed, common in the South Atlantic States, is unknown in the Middle Western States, or Alfalfa Light Grain Mixed, common in the Pacific Coast States, is unknown in the North Atlantic States. The hay classes in United States standards are national in scope, and each market or producing district will use such classes as are of local importance.

In all United States hay standards the term "grade" is used to describe the quality of hay. The quality varies in all classes of hay, according to the conditions under which the hay was produced. Each class of hay is divided into three numerical grades, U. S. No. 1, U. S. No. 2, and U. S. No. 3. Each such grade has different quality requirements. In all classes there is a Sample grade for inferior hay not good enough for the numerical grades.

In the Timothy and Clover hay, Prairie hay, Johnson and Johnson Mixed hay, Grass hay, and Mixed hay standards, color is the most important grading factor and foreign material is a grading factor of secondary importance. In the Alfalfa and Alfalfa Mixed hay, Soybean and Soybean Mixed hay standards and the tentative standards for Lespedeza and Lespedeza Mixed hay, the grading factors are leafiness, color, and foreign material, of which leafiness is the most important. In the Grain, Wild Oat, Vetch, and Grain Mixed hay standards, grading factors are maturity, color, and foreign material, of which maturity is the most important.

The numerical grades and Sample grade define the quality and condition of the greater part of the hay crop in the United States. They have been designed to cover the common run of the good, fair, and poor quality hay in the trade in a definite and practical way. In United States standards the numerical grades and Sample grade are supplemented with special grades to describe and emphasize the superior or inferior qualities of certain kinds of hay.

United States hay standards recognize the fact that certain characteristics, as exceptional leafiness in alfalfa and lespedeza hay and exceptional green color in all kinds of hay, affect palatability and feed value and thus create price differentials from the average of the common run of hay. These exceptional characters occur in but a small part of the hay crop, and cannot be used as practical grading factors on a common basis with the color, leafiness, and foreign-material specifications employed in the grading of common-run hay. They must be described in a specific manner in the inspection and grading of hay, otherwise wide spreads of value and price would occur occasionally in the same grade.

This problem of describing and emphasizing certain superior or inferior characters of hay is met in the United States standards by the use of special grades entitled "Grades for extra green hay", "Grades for green hay", "Grades for extra leafy hay", "Grades for leafy hay", "Grades for coarse hay", "Grades for stemmy hay", and "Grades for fine Johnson hay", which appear in paragraph form after the tabulated standards for each group. These special grades are so arranged that the designation for the special grade is included with the numerical or Sample grade and make a part of the complete grade designation. The following paragraphs discuss some of the special grades and illustrate their application.

It is a well-known fact that approximately two-thirds of the protein of the alfalfa plant is contained in the leaves and because of this fact purchasers of dairy alfalfa usually demand hay which is

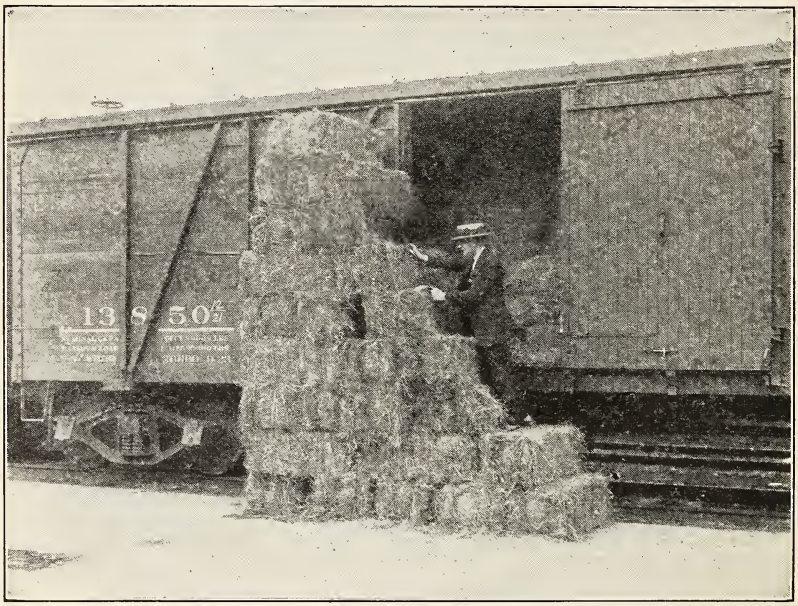

FIGURE 9.—A Federal hay inspector examining the leafiness, color, foreign material, and condition of a carload of alfalfa to determine the grade according to United States standards.

leafy in character. U. S. No. 1 Alfalfa must be hay which meets No. 1 grade requirements for all three of the factors, leafiness, color, and foreign material. If alfalfa hay is exceptionally leafy (50 percent or more), or leafy enough for the No. 1 grade (40 percent or more) but deficient in one of the other grading factors, special grades are used to portray these leafy qualities. For example, a lot of hay classed as Alfalfa, which meets the requirements of the No. 1 grade, and in addition thereto has an exceptional amount of leaves, most of which are clinging to the stems, is graded U. S. No. 1 Extra Leafy Alfalfa instead of U. S. No. 1 Alfalfa, which latter designation would apply in case no special grades were available for extra leafy hay.

The special grades in United States standards are to be considered as terse descriptions of the superior or inferior characters in hay which may be employed when necessary to supplement the numerical or Sample grade description and to differentiate such hay from the common run of hay that is described by the numerical or Sample grade designations.

Prior to 1925, the Federal hay-inspection service was limited because United States standards were available only for timothy and clover hay. The publication of standards for alfalfa, prairie, and Johnson hay immediately increased the demand for inspection. The more recent publications of the standards for grain, wild oat, vetch and grain mixed hay, and soybean hay, and the tentative standards for lespedeza hay have greatly increased the demand for inspection. In January 1935, 25 States in which hay production or consumption is important, had adopted United States standards as official State standards. Inspectors trained, licensed, and supervised by the United States Department of Agriculture were furnishing shipping-point inspection at 118 points, and in addition inspectors are stationed at 36 large central markets (fig. 9). United States hay standards are used as a basis for all hay purchases of the Federal Government. Hay purchased by the United States Army which is a considerable item in the hay commerce of the United States is inspected by Veterinary Corps Officers who are trained and licensed by the United States Department of Agriculture. Army experience with United States hay standards has proven of value to contractors as well as to the Army.

BEANS (DRY)

United States standards for dry edible beans were issued September 1, 1926, based on studies and investigations that were inaugurated in 1923. Careful consideration was given to the many commercial classes of beans, their varied uses, the different conditions under which they are produced, and problems involved in bringing them up to the standard of quality desired by various consumers as they relate to standardization. Several thousand commercial samples of the 1923, 1924, and 1925 crops of various classes of beans from typical districts of production were analyzed to determine the range and correct interpretation of such factors of quality as moisture, splits, damage, and foreign material. Based on data obtained as a result of the application of the standards by Federal licensed inspectors the standards were revised effective September 1, 1931. A further revision was made effective October 1, 1934, applying largely to beans of the types produced in California.

For the purposes of standardization, beans must be classified. At present the United States standards comprise 20 commercial classes. Each class is divided into three numerical grades designated "U. S. No. 1", "U. S. No. 2", and "U. S. No. 3", with the exception of the classes Lima and Baby Lima, the grades for which are designated "U. S Extra No 1", "U. S. No. 1", and "U. S. No. 2." Beans that do not meet the requirements of any of the numerical grades applicable to a given class are designated "U. S. Sample grade."

The grade or quality of beans depends on their wholesomeness for food and their relative commercial value as evidenced by their

general appearance and degree of freedom from moisture and such defects as split beans, damaged beans, foreign material of any nature, and mixtures of other kinds or classes of beans.

As a factor of quality in beans, the general appearance must be considered as to good natural color, plumpness, uniformity of size, and checked skins. Color is affected by weather conditions, age, and other causes. Only when a lot of beans contains a sufficiently large percentage of such off-colored or slightly-stained beans to affect its appearance seriously is this factor considered.

Absolute uniformity in size is neither necessary nor practicable. The presence of shriveled, undersized, and immature or undeveloped beans gives an uneven appearance to a sample and indicates that it has not been submitted to ordinary cleaning and screening operations.

The percentage of moisture contained in beans must necessarily be kept within certain limits to permit storing them without danger of deterioration. It is not a serious factor when the beans are well matured and harvested under favorable conditions, but when conditions are conducive to excessive moisture, there will be heavy losses from heat, mold, and other damage unless unusually good care is taken in storing.

In itself a split bean may be wholesome food, but when mixed with sound whole beans it destroys their uniform appearance and cooking qualities. It is more susceptible to damage and deterioration than a whole bean.

There are various types of damage in beans, chief among which are weather, frost, disease, insect, and a combination of damage of two or more of these types. The importance of damage as a grade factor is emphasized by its relatively greater effect on quality and the difficulty attending its removal from a given lot of beans.

As a grade factor, foreign material may be considered more objectionable than any other because of its nature. But since, in most cases, it is easily removed by present-day cleaning machinery, it is practicable to keep the percentage allowance in the respective grades within very narrow limits. Foreign material in the form of adobe and stones is more prevalent in beans grown in the Rocky Mountain and Pacific Coast States because of the nature of the soil and methods of harvesting and preparing for market.

Domestic beans of mixed type rarely if ever appear on the market. Slight mixtures sometimes occur, however, and the quality or grade of the beans is affected thereby. Fortunately, mixing can be prevented by the exercise of reasonable care in the selection of seed and in handling beans through the various processes of preparation for market, and the percentage of " other beans " appearing in commercial lots of a given class is very low. Beans of different classes which blend in color and size are not so objectionable as those of contrasting types, and a larger percentage of such beans may be permitted in a lot without seriously affecting its commercial quality.

The classes defined in the standards include all beans identical in type with such classes regardless of where grown. For example, beans of foreign origin that are practically identical in type with the large white beans characteristic of those varieties grown on the Pacific coast would be classed " large white " if offered for inspection under the United States standards. Many types of beans imported

from various countries cannot be classed under any of the classes now provided in the standards. This condition seems to warrant the incorporation of other classes in the standards to cover the more important of these types, and studies are being conducted with this in view.

One of the prime objects of United States standards for beans is to insure consistent deliveries as to quality purchased. This can be more fully accomplished when such standards are uniformly applied under the supervision of a disinterested agency. To this end a Federal bean-inspection service has been organized to provide inspection on the basis of the United States standards by men trained and licensed by and under the supervision of the United States Department of Agriculture. On January 1, 1935, inspectors at 29 important shipping points and terminal markets held licenses to inspect beans under cooperative agreements with State departments of agriculture or commercial exchanges.

SOYBEANS

With the rapid increase in the production of soybeans, the development of a commercial outlet or an industrial market naturally followed. At the same time it was evident that standards of quality that would reflect the relative value of soybeans for industrial purposes were needed to insure more equitable returns to growers. After extensive studies of marketing practices and requirements of the soybean-crushing industry, tentative standards were issued in 1925. Following a year's trial these standards were revised slightly, effective September 1926, and were recommended for use in the grading and marketing of this commodity.

For purposes of standardization soybeans are divided into five classes on the basis of color: Yellow, Green, Brown, Black, and Mixed. There are four grades in each class—U. S. No. 1, U. S. No. 2, U. S. No. 3, and U. S. No. 4. There is also a Sample grade to take care of any lots that do not meet the requirements of the standardized grades. The grades are based on variations in the following quality factors: (1) Condition and general appearance, (2) test weight per bushel, (3) moisture, (4) split soybeans, (5) damaged soybeans, and (6) foreign material.

The use of these standards is increasing with the expansion of the soybean-crushing industry. They have been made the basis of contract for practically all soybeans purchased by mills, and are applied by Federal licensed inspectors located at terminal markets and crushing centers in the Corn Belt and South Atlantic States. Inspection is available at shipping points in the producing sections of North Carolina and Missouri, from which large quantities of soybeans are shipped for seed purposes.

Extensive use of these standards has demonstrated their practicability in the marketing of soybeans both for seed and for crushing purposes. The U. S. No. 1 grade represents high-quality seed stock insofar as the absence of physical defects is concerned. U. S. No. 2 is the basic grade on which soybeans are purchased by mills. A slight premium is paid by mills for U. S. No. 1, whereas U. S. No. 3, U. S. No. 4, and Sample grade soybeans are subject to appropriate discounts.

PEAS (DRY)

Tentative United States standards for use in the grading and marketing of dry peas were issued August 1, 1933. These standards are based on data obtained as a result of studying production problems, methods of processing, and manufacturers' and consumers' requirements of commercial dry peas. The standards cover four major commercial classes—Alaska, Bluebell, First and Best, and White Canada. Provision is made also for the grading of peas not specifically classified. In view of the fact that most of the commercial peas as well as seed peas, are produced under contract a provision was made in these standards for the inspection and certification of peas as to dockage, such certificate to become the basis of settlement under the contracts. After 2 years of application the tentative standards were revised and made official, effective June 10, 1935.

The Federal inspection service for dry peas is being made available in all markets and sections in which there is sufficient demand for it. Most of the inspections heretofore have been made in the producing sections of northern Idaho and eastern Washington. Inspectors located at Moscow, Idaho, with the aid of licensed samplers located throughout the producing section have been serving this territory effectively. The service is now available at many other points in the Pacific Northwest and in California and at important terminal markets in the East where official samplers are located.

BROOMCORN

Broomcorn has been marketed in the past in a rather haphazard way without uniform practices or uniform standards of quality or grade. As it is a comparatively small crop and has a limited use, it has failed to command the attention of marketing agencies, which have played such an important part in developing uniform marketing practices and standards for the more important agricultural products.

United States standards for broomcorn were promulgated on July 1, 1926, as a result of about 4 years of investigational work by the Bureau of Agricultural Economics. They were revised effective March 1, 1931. Immediately after the promulgation of these standards, they were put into use by the Department of Agriculture in an inspection service conducted in cooperation with the Oklahoma State Department of Agriculture. A similar Federal-State inspection service was established in New Mexico in 1929 and some use of the standards has occurred in other States.

Much interest in standardization of brooms developed among manufacturers in the fall of 1929. It was evident that little could be done to standardize brooms without definite and generally used standards for broomcorn. As a result, broomcorn dealers and broom manufacturers appointed a committee to work with the Department of Agriculture in developing the Federal broomcorn standards and the inspection service, but as national standards for broomcorn have not yet been generally accepted by the industry, and as sufficient funds were not available, Federal inspection has been discontinued for the time being.

LIVESTOCK AND MEATS

For years it has been apparent to the most casual observer that much of the confusion in the central livestock markets might be avoided by adopting a proper system of standardization. Those who attempted to study the market requirements for the country as a whole were handicapped not only by the necessity of understanding the preferences, standards, and business methods of the individual markets but also by the practice of using identical terms with wide variations in meaning. Credit is given to the University of Illinois for the pioneer research work in Chicago and other large livestock markets which led to the publication of a bulletin entitled "Market Classes and Grades of Cattle with Suggestions for Interpreting Market Quotations."

When the Bureau of Markets, now the Bureau of Agricultural Economics, inaugurated in 1917 a market-reporting service on livestock and dressed meats the recommendations of the Illinois station were used as a basis for reporting prices and trade conditions.

At the same time, under provisions of the annual agricultural appropriation acts which have provided authority and funds for marketing research, the scope of the original investigation was greatly broadened to include the development of a complete system of classification for livestock and dressed meats.

Before proceeding to a discussion of grades it should be understood that livestock are separated into various groups before the actual grading is done.

Kind refers to the species, as Cattle, Hogs, or Sheep.

Class separates cattle; for example, into Steers, Heifers, Cows, Bulls, Stags.

Subclass provides for subdivisions based upon the relative desirability of the animal for certain rather general purposes; as Slaughter, Feeder, or Stocker.

These subclasses based upon general use are not sufficiently accurate to cover all needs of the trade; therefore it is frequently necessary to provide additional subdivisions based on particular suitability for certain special uses; as, for example, by dividing slaughter hogs into Butcher, Bacon, and Packing hogs.

Further segregations are made on the basis of age and weight. Certain classes of consumers still require heavyweight cuts of meats, but there is a rapid shifting of demand to lightweight cuts. Stockyard operatives therefore sort animals to obtain cuts that will meet these requirements.

The grades for livestock are based on three basic factors: Conformation, finish, and quality.

Conformation is the build, outline, or contour of the animal. It is due largely to the size and shape of the bones and muscles and the proportions between the different primal parts, such as round, loin, rib, or shoulder. Hence conformation is chiefly attributable to breeding, though sex condition also exerts a powerful influence, except in the case of very young animals. Fat covering is responsible for marked modifications of conformation; hence feeding and care have an important bearing on the matter. Standards or ideals of conformation depend on the immediate use to which the animal is to be

put. Grade for grade, a smoother and rounder conformation is demanded in animals intended for immediate slaughter than in those that are to be used for further feeding.

Finish is fat. It includes the fat on the outside of the animal's body and on the inside of the abdominal and thoracic cavities, and the deposits of fat within and between the muscles. Naturally in the live animal the interior fats can be judged only by analogy. Finish involves the quantity, quality, and distribution of fat. Like conformation, it is dependent somewhat on inherited tendencies or breeding, but in the main it depends on the quantity, kind, and quality of feed, the sex condition of the animal, and the methods of handling.

Quality is, strictly speaking, a characteristic of the muscle or lean meat of the animal and of the intramuscular and intercellular fat contained therein. It also involves the relative size, shape, and condition of the bones and the ratio of bone to muscle and fat. In animals intended for further feeding, quality involves still another characteristic, a characteristic which though of great importance is rather intangible and difficult to describe fully—the ability to economically take on added weight. This is likely to be an inherited trait or tendency. Quality in a live animal is difficult to describe. By experienced stockmen it can be judged with fair accuracy from certain external evidences, such as fineness and softness of hair, thickness and pliability of hide, width of muzzle, refinement of head, and other similar characteristics. Frequently these external features are called quality. When this is done it amounts to accepting the external evidences of a thing for the thing itself.

As in the case of other agricultural products, the grading of livestock has not been reduced to the status of an exact science. But there is a close correlation between certain external and internal characteristics which enable the experienced grader to do his work with surprising accuracy.

The grades for dressed meats exactly correspond in number and names with those of the live animals that produce them and are based on the same factors, but in the case of meat the color of flesh, fat, and bone may also be taken into consideration (figs. 10 and 11).

Official United States standards for carcass beef were promulgated by the Secretary of Agriculture to become effective July 1, 1926. These standards had been used continuously in the Department's wholesale meat-market reporting service since February 1917. They had also been applied in the grading of millions of pounds of meat for use by the United States Lines, for many independent steamship lines, and for other commercial concerns, not to mention the purchasing departments of numerous public institutions, both Federal and State.

Official standards for beef, veal, calf, lamb, and mutton, and tentative standards for pork, are now used at several large wholesale meat centers under immediate supervision of Government graders and are used by some commercial meat interests in buying and selling. As a result of the work of Government graders the designations of some of these grades are carried through to the consumers on millions of pounds of meat.

Prior to the official promulgation of these standards, public hearings were held in Portland, Oreg., Chicago, Ill., and New York City,

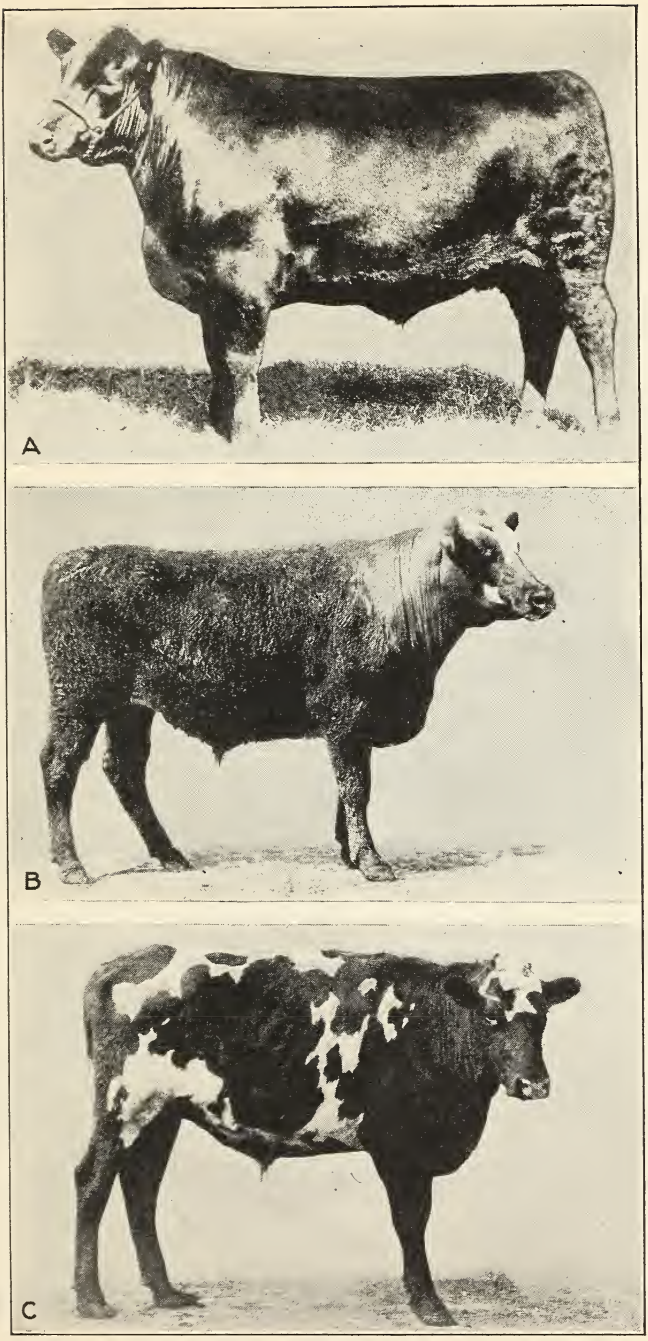

FIGURE 10.—Grades of slaughter steers. *A*, Prime grade slaughter Steer; *B*, Good grade slaughter Steer; *C*, Plain (Common) grade slaughter Steer.

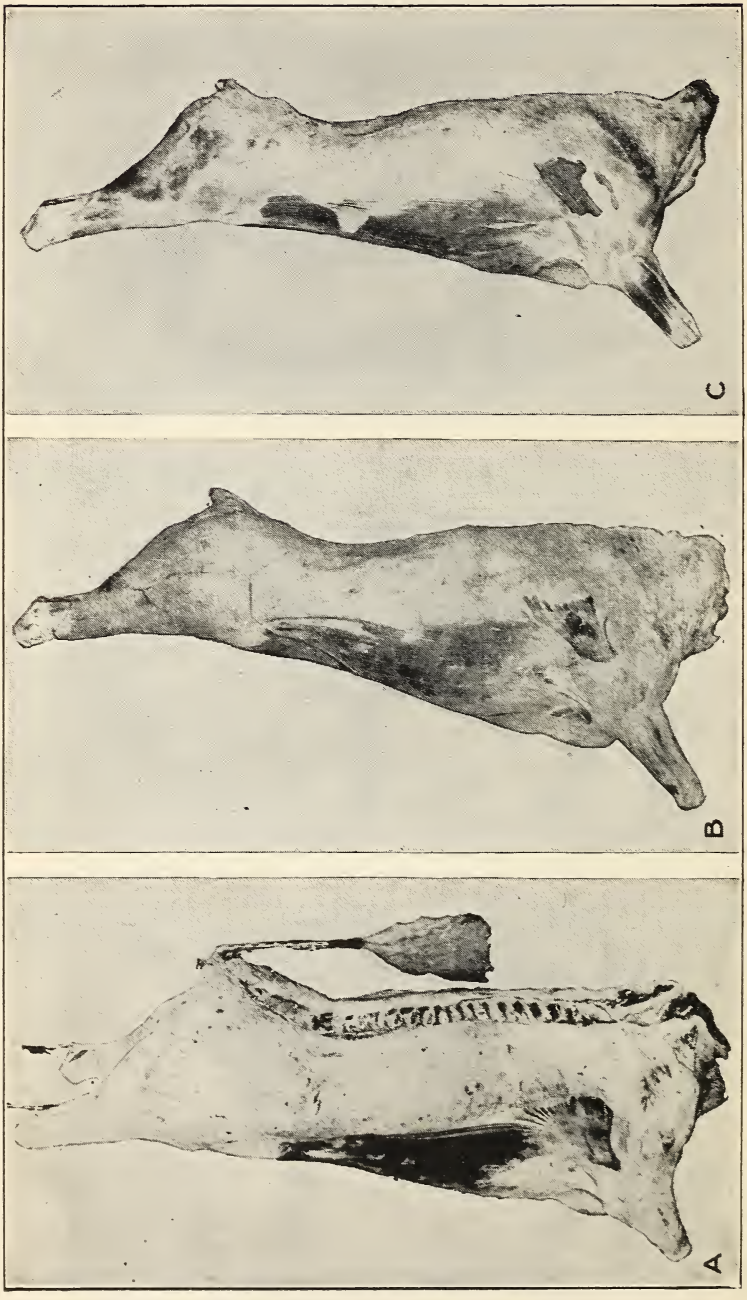

FIGURE 11.—Grades of Steer carcasses. *A*, Prime grade Steer carcass; *B*, Good grade Steer carcass; *C*, Plain (Common) grade Steer carcass.

to which livestock producers, slaughterers, wholesale and retail meat dealers, agricultural college workers, and others interested in the livestock and meat industries were invited. The sentiment manifested at these meetings was overwhelmingly favorable, and certain suggestions then made were given careful consideration in later revisions of the grades in these standards.

Many other hearings have been held in the livestock and meat-consuming centers of the country at which tentative standards for cattle, calves, sheep, and lambs and their carcasses have been presented for suggestions and criticism.

TOBACCO

The Department's research regarding the standardization of American-grown tobacco has extended over a period of years. The first standards were completed in 1922 and issued in tentative form as a basis for discussion and for experimental use in the industry. These investigations were carried on under authority of that section of the United States Warehouse Act that authorizes the Secretary of Agriculture to establish and promulgate standards for agricultural products by which their quality or value may be judged or determined. Since the passage of the Tobacco Stocks and Standards Act, which provided that the Secretary of Agriculture shall establish standards for the classification of tobacco, the tobacco standardization work of the Department has been conducted under authority of the latter act.

In January 1926, a "Type Classification of American-Grown Tobacco" was prepared and issued under the authority of the United States Warehouse Act. For warehouses licensed under this act it is required that the types of tobacco be stated on the receipts, and heretofore no uniform system of type classification had existed. In March 1929, this classification was revised and issued by the Secretary under authority of the Tobacco Stocks and Standards Act. In October 1929, the classification was amended to cover classes, types, and groups of grades and was published as the Classification of Leaf Tobacco.

According to the official classification of the United States Department of Agriculture all American-grown tobaccos are divided into seven classes. The first three are based on the method used in curing, the next three are based on the principal use for which the tobacco is grown, and the seventh covers small types not otherwise classified. These classes are: Flue-cured types, fire-cured types, air-cured types, cigar-filler types, cigar-binder types, cigar-wrapper types, and miscellaneous types.

The six classes cover 26 important types with 2 to 6 types in each class. The classification establishes the groups of grades for each of the 26 important types. Under the Tobacco Stocks and Standards Act the leading dealers and manufacturers are required to report to the Department, quarterly, their stocks of leaf tobacco segregated by type and groups of grades. Standard grades have been published for 23 types.

Tobacco is graded on the basis of the following four factors: Group, quality, color, and length. This four-in-one standard is

necessary in grading tobacco in order that the trade can select tobacco suited to its particular needs with respect to each factor.

There are from four to six groups of grades in each type. The group names vary with most types, but the standard symbols are the same for the corresponding groups of all types. The standard symbols and group names for burley tobacco, for instance, are: A—wrapper, B—leaf, C—lugs, X—flyings, S—scrap, and N—nondescript.

As many as six qualities may appear in a group, which are designated by numbers following the group letters. The group and quality factors, thus designated by a letter and a number, form the basis of all standard grades. Suitable symbols are added to designate color and length when they are of sufficient importance.

The various degrees of quality, from 1 to 6, are based upon the following elements of quality according to their importance in the particular group: Cleanness, soundness, smoothness, texture, elasticity, oil, wax, maturity, grain, solidity, body, strength, finish, venation, width of leaf, cure, uniformity, and injury.

The color of tobacco varies with the different types. In types in which the color is of sufficient importance to be shown as a part of the grade, the several colors are designated by letters. Some of the important colors are: L—light, F—medium, R—red, D—dark, G—green, and M—mixed. In the flue-cured class the lights are lemon colored, the mediums are orange colored, and the darks are mahogany colored.

Standards of length have been established and published. These standards provide for different variations in length of from 1 to 8 inches or 2½ to 20 centimeters. This permits the tobacco to be assorted and graded into as many lengths as may be desired for the particular type and group. The several lengths, commonly known as sizes, are all designated by different series of numbers.

A complete tobacco-grade symbol, with the four factors arranged in order, forms a code by which the grade may be analyzed. The code system conforms to trade practice, makes for brevity, and facilitates commercial transactions. For example: Grade B5F43 (of type 21) refers to the "leaf" group of tobacco, fifth quality, medium color, and size 43. Grade A2L (of type 11) refers to wrapper tobacco, second quality, and lemon color.

The primary purpose of Federal standards for tobacco is to furnish the basis for inspection and market news service to growers. Federal standards have been adopted, however, for purposes of future trading and may be found of increasing usefulness in transactions between dealers in tobacco and their customers.

WOOL

Wool standards became particularly desirable during the World War. At that time much difficulty was experienced in connection with Government contracts for materials made wholly or partially of wool. The need for such standards was further emphasized by those engaged in the general improvement of wool-marketing practices. Appropriations and authority for the wool-standardization investigations were accordingly carried in the agricultural appropriation acts.

In carrying on the preliminary research the Department of Agriculture secured the cooperation of the wool trade. Dealers and manufacturers supplied samples representing their ideas of market grades. The samples supplied in most instances were of the types actually used by the houses submitting them. In this way many hundreds of samples, embracing the many market grades, were collected for the Department's use.

These samples were assembled according to stated grades, and representative staples were drawn from them for classification, according to diameter of fiber. A study of these classified samples revealed a pronounced overlapping of the grades and showed none of the grades or standards then existent to be acceptable to the trade as a whole.

Another classification of the samples was made in which all were arranged according to diameter of fiber, regardless of grade specified. By elimination of duplicates the number of samples representing the range in diameter of fiber, in almost equal gradations from the finest to the coarsest, was reduced to 26.

A subclassification divided the range covered by the 26 samples into 7 sections of approximately equal scope. A set of samples, duplicating the specimens of maximum diameter of fiber in each of the 7 groups, was prepared and set up as a possible means of defining the lines of demarcation for the 7 primary market grades.

On completion of the preliminary work the set of type samples was submitted to a number of wool and textile authorities called in conference to consider the proposed grades. As the reaction of the conference was favorable to the grades recommended, preparation of copies of the original set of grades was begun. These sets, mounted in boxes and accompanied by appropriate descriptive matter, were made available for release as the "tentative wool grades" of the Department of Agriculture.

Investigations to determine the practicability of the tentative wool grades were conducted by (1) grading wool according to the tentative wool grades, (2) submitting sets of the tentative wool grades to authorities for criticism, (3) providing sets for use in demonstrational and educational work, and (4) holding public hearings for the discussion of the proposed grades.

During the shearing seasons of 1920, 1921, and 1922, several wool classifiers were engaged by the Department in cooperation with the marketing bureaus and other agencies of a number of States to test the tentative wool grades in actual grading work.

In order that those who were directly connected with the handling of wool in the markets might be given an opportunity to study the proposed grades and submit their opinions of them, sets of the grades were sent to a number of wool dealers, wool manufacturers, and others, and their criticisms were asked for.

Sets of tentative wool grades were sent on request to agricultural colleges, woolgrowers' associations, textile schools, wool-testing houses, wool and textile publications, banks in woolgrowing and wool-marketing centers, agricultural extension workers, and others interested in wool and wool grading.

After a series of hearings the tentative wool grades were promulgated by the Secretary of Agriculture as the official permissive standards for wool, effective July 1, 1923.

At a final hearing held in Washington, D. C., the tentative wool grades were endorsed, and their establishment as standards according to American nomenclature was recommended by the joint committee on research and standardization, representing the National Association of Wool Manufacturers, the American Association of Woolen and Worsted Manufacturers, and the National Association of Worsted and Woolen Spinners. This committee further recommended that the Department consult with authorities of the British wool and textile industries to the end that a correlation of the United States and British classifications might be effected and a system of nomenclature worked out that would take cognizance of the wool imported into this country. In accordance with the suggestions made by members of the industry at this hearing in Washington, a committee comprising one representative each from the United States Department of Agriculture, the United States Department of Commerce, and the manufacturing industry was appointed. The committee proceeded to England in the interest of possible correlation of the American and English grades.

The Bradford Chamber of Commerce called a meeting of representatives of the English textile industries, including spinners, manufacturers, export merchants, and the British Wool Federation, to consider the correlation of English and American grades and the establishment of international standards for wool grades. These textile interests authorized the British Wool Federation to represent and act for the wool textile associations of England.

A representative committee was appointed by the president of the British Wool Federation, which, with the American committee, inspected the wool grades then in use by the various concerns in the Bradford district. A set of 12 grades was prepared, representing the average Bradford qualities based on diameter of fiber. These were brought to the United States for use in further research.

From these samples a set of tentative numerical grades representative of the average Bradford qualities was prepared and correlated with the grades of the official wool standards of the United States. A cabinet containing the resulting set was sent to England for the consideration of the committee of experts appointed by the British Wool Federation. After a careful examination by the committee slight changes were suggested. These changes were made when the cabinet was returned to Washington. The action of the joint English and American standardization committee was approved by a representative committee of the wool-textile industry.

In September 1925 the United States wool standardization committee, composed of one representative each of the United States Department of Agriculture, the United States Department of Commerce, and the cooperating manufacturing associations, visited England for the purpose of bringing to a final conclusion, if possible, the correlation of the American and English grades.

The work of correlating the proposed official wool standards and average Bradford qualities was carried on by a committee composed of members of the British Wool Federation appointed by the Bradford Chamber of Commerce, in cooperation with the American committee. The English committee suggested that standard grades for wool top be established corresponding with the diameter of fiber in

the wool standards. This suggestion met with the approval of the American committee. At the conclusion of the conferences between the English and American committees, the Bradford Chamber of Commerce, acting for all of the allied wool-textile associations in Great Britain, advised that the action of the British committee had been unanimously approved by the chamber.

After the arrival of the American committee in the United States, group conferences were held with members of the wool industry with reference to the establishment of numerical grades for wool and top. As a result of these several conferences sets of proposed numerical grades for wool and wool top were prepared and presented for consideration of members of the industry at the hearing in Washington, D. C., in April 1926.

Work pertaining to the development of the proposed standards and preparation of the forms was fully explained and the representatives were given an opportunity to examine the grades in the proposed standards. Comments and criticisms were urgently invited. No opposition was manifested and a motion to indorse the grades and recommend their adoption as the official standards of the United States for grades of wool and wool top was unanimously passed.

Following the action of the meeting, the standards, embracing 12 grades for wool and wool top, were officially promulgated under authority of the United States Warehouse Act to become effective July 1, 1926. Subsequently, they were repromulgated under the Wool Standards Act to become and be effective for the purpose of that act on and after September 1, 1931 (fig. 12).

As promulgated, the grades of the standards are designated by both the numerical terms and the American or blood terms. A correlation of the terms of the two systems is given in the following tabulation:

Numerical	American
80's, 70's, 64's	Fine.
60's, 58's	½ blood.
56's	⅜ blood.
50's, 48's	¼ blood.
46's	Low ¼ blood.
44's	Common.
40's, 36's	Braid.

Sets of the official wool standards are prepared in a partial or condensed form of 7 grades, and in the complete form of 12 grades. The two series of the wool standards are provided to facilitate their use when grading whole fleeces of wool as well as when grading the qualities found within the fleece. The official standards for wool top are prepared in the complete form only.

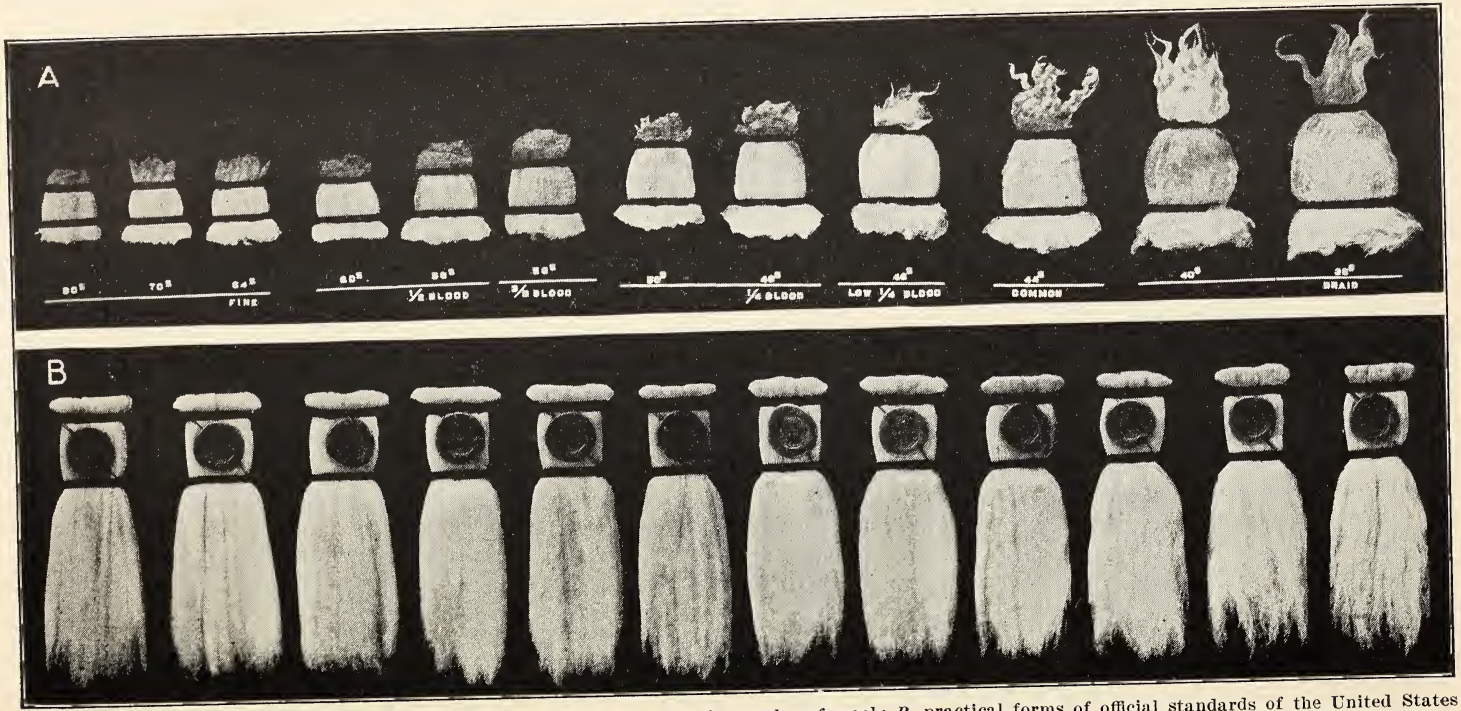

FIGURE 12.—*A*, practical forms of official standards of the United States for grades of wool; *B*, practical forms of official standards of the United States for grades of wool top.

LIST OF STANDARDS FOR FARM PRODUCTS FORMULATED BY THE BUREAU OF AGRICULTURAL ECONOMICS

Complete sets of the specifications or descriptions of the grades in all the standards formulated by the Bureau of Agricultural Economics are seldom needed by workers but a detailed list of such standards can usually be supplied in mimeographed form on request to the Bureau of Agricultural Economics. The following list, as of 1935, will always be suggestive and can be used as a basis for requests for selected standards.

COTTON

Grade and color:
Upland:
White grades. Promulgated 1914; last revision effective 1936.
Yellow tinged, yellow stained, and blue stained colors. Promulgated 1916. Tinged and yellow stained last revised effective 1936. Blue stained eliminated, effective 1936.
Gray, spotted and light stained. Promulgated 1922. Gray and spotted last revised effective 1936. Light stained eliminated, effective 1936.
Extra white. Promulgated 1926; last revision effective 1936.
American-Egyptian (grade and color). Promulgated 1918; last revision effective 1930; descriptive half grades added 1930, effective 1931.
Sea-island (grade and color). Promulgated 1918; discontinued 1925.
Length of staple. Promulgated 1918; original representations, last revision 1928, effective 1929; staple types of additional lengths effective 1933.

NOTE.—Service and Regulatory Announcements 92, 109, 117, and 146 (Agr. Econ.) contain descriptions of all cotton standards now in force.

American cotton linters:
Grade: Promulgated 1925, effective 1926. (Service and Regulatory announcements 94 (Agr. Econ.).)
Color: Promulgated 1927, effective 1928. (Service and Regulatory announcements 109 (Agr. Econ.).)

DAIRY AND POULTRY PRODUCTS

Butter. Recommended 1918. (Service and Regulatory Announcements 51, (Markets).)
Cheese. American (whole milk). Recommended 1922. (Office of Secretary, Circular 157.)
Eggs (bulk). Recommended 1923; last revision 1929.
Eggs (individual). Promulgated 1934.
Poultry, dressed. Recommended 1931.
Poultry, live. Recommended 1928; last revision 1934.
Rabbits, dressed domestic. Recommended 1932.
Turkeys, dressed. Recommended 1928; revised 1933.
(Mimeographed circulars, unless otherwise stated.)

FRUITS AND VEGETABLES AND RELATED PRODUCTS

Anise, sweet. Recommended 1930.
Apples, barreled. Recommended 1918; last revision 1931. (Service and Regulatory Announcements 93 revised (Agr. Econ.) Amendment 1.)
Apples, cannery. Recommended 1929; last revision 1930.
Apricots. Recommended 1928.
Artichokes. Recommended 1926.
Asparagus. Recommended 1922; last revision 1933.
Beans, faba (fava). Recommended 1931.
Beans, snap. Recommended 1924; last revision 1934.
Beets, bunched. Recommended 1924; last revision 1927.
Beets, topped. Recommended 1934.

Broccoli, Italian sprouting. Recommended 1930.
Cabbage. Recommended 1921; last revision 1934.
Cabbage, for sauerkraut manufacture. Recommended 1932; revised 1933.
Cantaloups. Recommended 1923; last revision 1930.
Carrots, bunched. Recommended 1924; last revision 1932.
Carrots, topped. Recommended 1926; last revision 1928.
Cauliflower. Recommended 1922; last revision 1934.
Celery, rough. Recommended 1922; last revision 1934.
Cherries, red sour for manufacture. Recommended 1931.
Cherries, sweet. Recommended 1926; last revision 1927.
Citrus fruits, Florida and Texas. Recommended 1923; last revision 1934.
Corn, green. Recommended 1926; last revision 1927.
Corn, sweet for canning. Recommended 1932; last revision 1935.
Cucumbers, slicing. Recommended 1922; last revision 1932.
Cucumbers, greenhouse. Recommended 1934.
Dewberries and blackberries. Recommended 1926; revised 1928.
Eggplant. Recommended 1925; last revision 1933.
Endive or escarole or chicory. Recommended 1928; last revision 1933.
Garlic. Recommended 1927; last revision 1934.
Grapes, American bunch (Eastern type). Recommended 1925; last revision 1934.
Grapes, juice (European type). Recommended 1923; last revision 1934.
Grapes, sawdust pack (European type). Recommended 1925; last revision 1934.
Grapes, table (European type). Recommended 1924; last revision 1934.
Grapefruit, California and Arizona. Recommended 1929.
Honey, comb and extracted. Recommended 1927; revised 1933. (Circular 24.)
Honey Dew and Honey Ball melons. Recommended 1927; last revision 1934.
Kale. Recommended 1934.
Lettuce. Recommended 1922; last revision 1934.
Lettuce, greenhouse leaf. Recommended 1934.
Mushrooms. Recommended 1928.
Mustard greens. Recommended 1928.
Okra. Recommended 1928.
Onions, Bermuda. Recommended 1918; last revision 1933.
Onions, creole. Recommended 1926.
Onions, northern grown. Recommended 1920; last revision 1934.
Oranges, California. Recommended 1929.
Parsley. Recommended 1930.
Peaches. Recommended 1922; last revision 1933.
Peanuts, cleaned (unshelled Virginia type). Recommended 1932; last revision 1934.
Peanuts, farmers' stock runner. Recommended 1925; last revision 1931.
Peanuts, farmers' stock Virginia type. Recommended 1929; last revision 1934.
Peanuts, farmers' stock white Spanish. Recommended 1924; last revision 1928.
Peanuts, shelled runner. Recommended 1925; last revision 1925.
Peanuts, shelled Virginia type. Recommended 1932; last revision 1934.
Peanuts, shelled white Spanish. Recommended 1921; last revision 1925.
Pears. Recommended 1924; last revision 1932.
Peas, fresh. Recommended 1926; last revision 1934.
Pecans, unshelled. Recommended 1930; last revision 1934.
Peppers, sweet. Recommended 1923; last revision 1929.
Pineapples. Recommended 1924; last revision 1931.
Pineapples, Porto Rican. Recommended 1931.
Plums and prunes. Recommended 1923; last revision 1931.
Potatoes. Recommended 1917; last revision 1933.
(Service and Regulatory Announcements 93 revised (Agr. Econ.) Amendment 2.)
Radishes, bunched. Recommended 1926.
Raspberries. Recommended 1931.
Rhubarb, field grown. Recommended 1933.
Romaine. Recommended 1928.
Shallots, bunched. Recommended 1927; last revision 1934.
Spinach. Recommended 1925; last revision 1931.
Spinach, cannery. Recommended 1930; last revision 1931.

Strawberries. Recommended 1918; last revision 1934.
Strawberries for manufacture. Recommended 1935.
Sweetpotatoes. Recommended 1920; last revision 1926.
Tomatoes, canning. Recommended 1923; last revision 1926.
Tomatoes, fresh. Recommended 1922; last revision 1934.
Tomatoes for manufacture of strained tomato products. Recommended 1933.
Tomatoes, greenhouse. Recommended 1934.
Turnips, bunched. Recommended 1924; last revision 1927.
Turnip greens. Recommended 1928.
Turnips or rutabagas, topped. Recommended 1933.
Watermelons. Recommended 1923; last revision 1925.
(Mimeographed circulars unless otherwise stated.)

FRUITS AND VEGETABLES (CANNED)

Canned applesauce. Recommended 1932; last revision 1934.
Canned beans, dry. Recommended 1933.
Canned beans, lima. Recommended 1931; last revision 1933.
Canned beets. Recommended 1929.
Canned carrots. Recommended 1932.
Canned cherries, red sour, pitted. Recommended 1933.
Canned mushrooms. Recommended 1931.
Canned pumpkin or squash. Recommended 1929; last revision 1934.
Canned sauerkraut. Recommended 1930.
Canned spinach. Recommended 1928; last revision 1933.
Canned succotash. Recommended 1932.
Canned tomato catchup. Recommended 1934.
Canned tomato juice. Recommended 1934.
Canned tomato pulp. Recommended 1932; last revision 1934.
(Mimeographed circulars.)

FRUITS AND VEGETABLES (BARRELED)

Cherries, pitted, sulphured or in brine. Recommended 1934.
Cherries, unpitted, sulphured or in brine. Recommended 1934.
Sauerkraut. Recommended 1934.
(Mimeographed circulars.)

FRUIT AND VEGETABLE CONTAINERS

Climax baskets. Promulgated 1916.
Berry boxes. Promulgated 1916.
Till baskets. Promulgated 1916.
(Service and Regulatory Announcements 104 (Agr. Econ.).)
Hampers. Promulgated 1928.
Round stave baskets (including straight-side baskets). Promulgated 1928.
Splint or market baskets. Promulgated 1928.
(Service and Regulatory Announcements 116 (Agr. Econ.).)

GRAIN

Corn. Promulgated 1916; last revision 1935.
Wheat. Promulgated 1917; last revision 1935.
Oats. Promulgated 1919; last revision 1935.
Rye. Promulgated 1923; last revision 1935.
Grain sorghums. Promulgated 1924; last revision 1935.
Feed Oats. Promulgated 1925; last revision 1935.
Mixed Feed Oats. Promulgated 1925; last revision 1935.
Barley. Promulgated 1926; last revision 1935.
Mixed grain. Promulgated 1934; last revision 1935.
Flaxseed. Promulgated 1934; last revision 1935.
(Handbook of Official Grain Standards of the United States, U. S. G. S. A., Form No. 90 contains descriptions of these standards.)
Rice, milled. Recommended 1918; promulgated 1927; last revision 1927.
Rice, rough. Recommended 1923; promulgated 1927; last revision 1934.
Rice, brown. Promulgated 1927; last revision 1927.
(Handbook of Official Standards for Milled Rice and Brown Rice, U. S. G. S. A., G. I. Form No. 179, contains descriptions of these standards. Standards for rough rice are described in mimeographed circular.)

HAY AND RELATED PRODUCTS

Timothy and Clover hay. Recommended 1923; promulgated 1925; last revision 1933.
Alfalfa and Alfalfa Mixed hay. Promulgated 1925; last revision 1933.
Prairie hay. Promulgated 1925; last revision 1933.
Johnson and Johnson Mixed hay. Promulgated 1925; last revision 1933.
Grain, Wild Oat, Vetch, and Grain Mixed hay. Promulgated 1933.
Soybean and Soybean Mixed hay. Recommended 1928; promulgated 1933.
Grass hay. Recommended 1923; promulgated 1925; last revision 1933.
Mixed hay. Promulgated 1925; last revision 1933.
Straw (Wheat, Oat, Barley, Rye, and Rice straw). Recommended 1932; promulgated 1933.
(Handbook of Official Hay Standards including Straw Standards, HFS–540.)
Lespedeza and Lespedeza Mixed hay. Recommended 1934. (Mimeographed circular.)
Broomcorn. Recommended 1926; last revision 1931. (Mimeographed circular.)
Beans, dry edible (21 classes). Recommended 1926; promulgated 1931; last revision 1934.
(Handbook of Official Standards for Beans, HFS–751 and Amendment No. 1, 1934.)
Soybeans. Recommended 1926.
(Handbook of United States Standards for Soybeans, HFS–899.)
Peas, dry. Recommended 1933; promulgated 1935. (Mimeographed circular.)

HIDES AND SKINS

Tentative schedules of market classes and grades of hides and skins.
Tentative schedules of market classes and grades of country and butcher hides.
Tentative market classes and grades of kips and calfskins.
(Mimeographed circulars.)

LIVESTOCK

Cattle, slaughter. Promulgated 1928. (Service and Regulatory Announcements 112 (Agr. Econ.) and Department Bulletin 1464.)
Cattle, feeder and stockers. (Tentative.) (Department Bulletin 1464.)
Calves, feeders and stockers. (Tentative.) (Circular 28.)
Calves, vealers and slaughter. Promulgated 1928. (Service and Regulatory Announcements 113 (Agr. Econ.) and Circular 28.)
Hogs, slaughter. (Tentative.) (Mimeographed circular.)
Sheep, slaughter. (Tentative.) (Mimeographed circular.)
Lambs, slaughter. (Tentative.) (Mimeographed circular.)

MEATS

Beef carcasses and cuts. Promulgated 1926. (Service and Regulatory Announcements 98 and 99 (Agr. Econ.) and Department Bulletin 1246.)
Beef, yearling. Recommended 1932. (Circular 208.)
Veal and calf carcasses and cuts. Promulgated 1928. (Service and Regulatory Announcements 114 (Agr. Econ.) and Circular 103.)
Lamb, yearling mutton, and mutton carcasses and cuts. Promulgated 1931. (Service and Regulatory Announcements 123 (Agr. Econ.) and Department Bulletin 1470.)
Pork carcasses and fresh pork cuts. (Tentative.) (Circular 288.)

TOBACCO

Flue-cured, types 11, 12, 13, and 14. Recommended 1922; last revision 1934.
Fire-cured, types 21, 22, 23, and 24. Recommended 1922; last revision 1933.
Burley, type 31. Recommended 1926; last revision 1933.
Maryland, type 32. Recommended 1933.
One-sucker, type 35. Recommended 1923; revised 1927.
Green River, type 36. Recommended 1922; last revision 1935.
Sun-cured, type 37. Recommended 1923; last revision 1927.
Seedleaf, type 41. Recommended 1926.
Gebhardt, Zimmer, and Little Dutch, types 42, 43, and 44. Recommended 1923.
Broadleaf, type 51. Recommended 1923.
Havana Seed, type 52. Recommended 1923.

Wisconsin, types 54 and 55. Recommended 1923; last revision 1933.
Southern shade grown, type 61. Recommended 1933.
Northern shade grown, type 62. Recommended 1933.
United States standard tobacco sizes. Recommended 1926. (Miscellaneous Circular 83.)
Classification of leaf tobacco. Promulgated 1929. (Service and Regulatory Announcements 118 (Agr. Econ.).)

WOOL

Wool. Diameter of fiber. Promulgated 1923; last revision 1931.
Wool top. Diameter of fiber. Promulgated 1926; last revision 1931. (Service and Regulatory Announcements 135 (Agr. Econ.).)

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